INVESTIGATING PREDICTORS OF COMMUNITY PARTICIPATION OF YOUTH WITH SIGNIFICANT DISABILITIES FROM NATIONAL LONGITUDINAL TRANSITION STUDY-2

By

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Submitted to the graduate program in the Department of Special Education and the Graduate Faculty of the University of Kansas in partial fulfillment of the requirements for the degree of Doctor of Philosophy

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Abstract

For decades, youth with significant disabilities have had consistently poor post-high school adult outcomes (Wagner, Newman, Cameto, Garza, & Levine, 2005). In addition, they often leave high school without skills, experiences, and support that lead to meaningful adult life roles. Emergent research indicates that individuals with significant disabilities can take on meaningful adult roles when provided sufficient supports, including integrated employment, participating in social networks of community life, and living in homes of their own. Using data from the National Longitudinal Transition Study-2 (NLTS-2), this study examined post-high school community participation outcome for youth with significant disabilities, and also examined malleable factors (i.e., youth, family, school, and community) associated with improved community participation. This study conducted descriptive analysis to address the level of community participation across three constructs: community presence, community involvement, and social engagement. The community participation criterion constructs and predictor constructs were established using multidimensional item response theory analysis. Furthermore, a latent regression analysis was conducted to determine the significance of the predictive relationship between criterion and predictor constructs. In addition to the predictive paths, covariates (i.e., gender, race/ethnicity, socioeconomic status) were considered to determine the degree of impact to community participation of youth with significant disabilities.

Results showed that youth with significant disabilities rarely participated in community locations. Half of youth participated in community activities or volunteer services, however, few reported to have established adult roles such as employment. Youth reported social engagement mostly with friends with more than half participating in social activities, getting invitations, or hanging out. Using multidimensional item response theory analyses, the criterion and predictor

latent constructs were established and the final model including six latent constructs (i.e., community involvement, social engagement, functional skills, classroom behaviors, access to the social networks, and access to the vocational programs) showed a good model fit. Latent regression analysis resulted that access to the social networks while in school is a strong predictor of both post-high school community involvement and social engagement of youth with significant disabilities. In addition, functional skills of youth are identified as a strong predictor of post-high school community involvement. Limitations, directions for additional research, and practical implications are described.

Acknowledgements

This research project could not have occurred without support and encouragement of several people around me. First, I would like to gratefully and sincerely thank Dr. Mary Morningstar, my advisor, who have been guided me past six years during my graduate studies at KU. She has given me tremendous support that allowed me not only to pursue research on topics for which I am truly passionate but also to grow as an independent researcher. Her mentorship was paramount in providing a well-rounded experience and encouragement especially when I went through health crisis. For everything you've done for me, I thank you Mary!

I also would like to thank to my doctoral committee—Dr. Karrie Shogren, Dr. Bruce Frey, Dr. Jennifer Kurth, Dr. Elizabeth Kozleski—for their input and valuable discussions about the design and implications of this research. In addition, I would like to thank Dr. Angela Murray who kindly helped me to negotiate many methodological concerns and eased my pain. A few other people at the CRMDA—Jason Lee, Leslie Shaw, Terrence Jorgensen—supported me to conduct higher level of quantitative analyses. I thank to them for their statistical advices.

I am thankful to my colleagues at the Transition Coalition—Amy Carlson, Barbara Bosche, Cherie Blanchat, Dana Latin, Marysa Sacerdote, Megan Gentry, Stephanie Ray-Oyler—who always have given me tremendous encouragement with their best wishes. I am also thankful to my dear friends—Aki Sato, Audra Classen, Hsiangyi Wu, Jooyoung Hong, Yujia Lei—for their patience, friendship, and especially humor that needed to survive our doctoral journey.

Finally, and most importantly, I would like to thank my parents and brother for their faith in me and support toward me to be as ambitious as I wanted. My family was always there cheering me up through the good and bad times. Without your love and encouragement, I would not have completed the doctoral program. Thank you!

Table of Contents

List of Tables

List of Figures

Chapter 1. Introduction

Problem Statement

Over the past two decades, despite improvements in postschool outcomes reported for all youth with disabilities (Newman, Wagner, Cameto, Knokey, & Shaver, 2010), successful adult outcomes have been less positive for youth with significant disabilities (Blackorby & Wagner, 1996; Newman et al., 2011; Wagner, Newman, Cameto, Garza, & Levine, 2005). The term, youth with significant disability, generally refers to youth with severe disabilities including intellectual disability, autism, multiple disabilities, and deaf-blindness (Snell & Brown, 2006). Longitudinal studies report that these youth tend to exit special education services without being employed or enrolled in postsecondary education, and continue to live in segregated settings (Metzel, Boeltzig, Butterworth, Sulewski, & Gilmore, 2007; Newman et al., 2011). Often youth with significant disabilities are marginalized even within special education (U.S. Department of Education, 2009), and evidence indicates that schools have difficult meeting the individual transition needs of this group of students with disabilities (Snell & Brown, 2006). A lack of successful movement from school to adult roles is different for both youth with significant disabilities and their families. Such results limit access to the community, economic self-sufficiency, and relationships with community members (Certo et al., 2009).

A review by Test, Mazzotti, and colleagues (2009) identified thirty-two predictors of postschool success of youth with disabilities; however the outcomes were mostly focused on employment and postsecondary education, and few reported predictors of independent living. For youth with significant disabilities, a few studies have investigated postschool outcomes; and among those that have, the focus has been on certain aspects of adulthood, such as employment (Bouck, 2012; Carter, Austin, & Trainor, 2012). Regardless of severity of disability, little is

known about community participation or practices supporting improved community engagement. From this perspective, research of postschool outcomes has often been viewed as simplified and dichotomous, instead of examining the multiplicity of postschool outcomes of youth who receive special education. Limited investigations of causal inferences regarding such views of successful adult outcomes unintentionally may limit evidence of promising transition practices and policies related to ongoing support for this group. Effective transition services across multiple dimensions of adulthood may increase the expectations of youth with significant disabilities beyond traditional segregated services, and expand meaningful adult life. Without careful planning, these youth face lifelong under-employment in segregated settings, limited access to community, and restricted relationships with others (Certo et al., 2009).

Purpose of the Study

The purpose of the present study is to better understand adulthood outcomes using extant data from the National Longitudinal Transition Study-2 focused on community participation and the examination of malleable factors (i.e., youth, family, school, and community) associated with improved community participation, particularly for youth with significant disabilities. The three criterion variables measuring community participation include: (a) community presence (i.e., being present in various community settings); (b) community involvement (i.e., participating in community activities and having presumed adult roles); and (c) social engagement (i.e., engaging in a network of personal relationships). The four domains of predictor variables include constructs associated: (a) youth-level (e.g., functional skills, social skills, communication skills, roles in transition planning, classroom behaviors); (b) family-level (e.g., parent involvement in education, parent outcome expectations, family support); (c) school-level (e.g., inclusion, access to the general curriculum, accommodations/modifications, access to the social network, access to

the vocational programs); and (d) community-level (e.g., types of community, accessibility to community and transportation). A logic model of this study is presented in Figure 1. Specifically, this study is interested in the answering four research questions:

> Research Question 1: What are the characteristics of post-high school community participation (i.e., community presence, community involvement, and social engagement) of youth with significant disabilities as measured from the National Longitudinal Transition Study 2?
>
> Research Question 2: Can community participation outcome constructs and predictor constructs (i.e., youth, family, school, and community domain) be established?
>
> Research Question 3: To what extent do youth, family, school, and community constructs predict the post-high school community participation of youth with significant disabilities?
>
> Research Question 4: To what degree do key covariates (i.e., gender, race/ethnicity, and socioeconomic status) influence community participation of youth with significant disabilities?

Hypotheses

Research Question 1 hypothesizes the development of a descriptive representation of the level of community participation of youth with significant disabilities, across three constructs: (a) community presence, (b) community involvement, and (c) social engagement. Community presence of youth with significant disabilities is described across 10 community settings: mall/café/coffee shop; outdoor physical activity settings; indoor physical activity settings; restaurant; bar/club; church; travel; camp/fishing/boating; health service facilities; and entertainment. Youth with significant disabilities' community involvement is explored to

determine if they were involved in community activities or were having presumed adult roles across various aspects. The level of social engagement describes the youths' engagement in the social or organized activities with friends.

Research Question 2 hypothesizes the establishment of community participation outcome and predictor constructs. Confirmation of the uni-dimensional latent constructs take place to establish the best model fit (see Figure 2). The community participation outcome is conceptualized with the three latent constructs: community presence, community involvement, and social engagement. Likewise, the predictor variables across four domains are conceptualized as: (a) five latent constructs for the youth-level domain (i.e., functional skills, social skills, communication skills, role in transition planning, classroom behaviors); (b) three latent constructs for the family-level domain (i.e., involvement in education, outcome expectation, family support); (c) five latent constructs for the school-level domain (i.e., inclusion, access to the general curriculum, accommodations/modifications, access to the social networks, access to the vocational programs); and (d) three latent constructs for the community-level domains (i.e., type of community, accessibility to community, accessibility to transportation). Confirmation of the multi-dimensional latent constructs take place to establish the best model fit (see Figure 3).

Research Question 3 gauges the relationships between predictor constructs and community participation outcome constructs of youth with significant disabilities. After confirming the multidimensional latent constructs, it is expected that youth constructs as well as family, school, and community level constructs would be statistically significant and meaningfully associated with improved levels of community participation. Specifically, youth who reveal higher capabilities in functional, self-care, household responsibilities, social, and communication skills, and active involvement in transition planning and classroom related tasks

would be more likely to visit community settings, be involved in community activities and roles, and engage in social relationships. Likewise, youth whose parents showed higher involvement in general and special education, positive expectations of their child's future, and high level of family support would be more likely to support community participation. It was expected that the school factors of youth who were: included in the general education, received accommodations/modifications to access to the general education curriculum, and involved in social network and vocational programs, would be more likely to associate with improved community participation outcomes. Last, the community level factors such as type of community, high level of accessibility to community and public transportation, would impact community presence, community involvement, and social engagement of youth with significant disabilities. Figure 4 describes a predictive path of criterion and predictor constructs.

Research Question 4 investigates the relationship between predictor constructs and community participation outcomes, taking into consideration moderating covariates of youth demographic characteristics, (i.e., gender, race/ethnicity, and socioeconomic status). It was hypothesized that the relationships between predictor constructs and criterion constructs would differ when youth demographic characteristics are taken into consideration.

Definition of Variables

Community Participation. Community participation is an ultimate outcome of education. "Community" refers to not only a place where you live and work, but also a place built on through common interests of individuals and connections among individuals (O'Brien & Blessing, 2011). The International Classification of Functioning, Disability and Health (ICF) of the World Health Organization (WHO, 2001) defined participation as "involvement in a life situation." Perenboom and Chorus (2003) expanded the definition of participation to

"involvement in a life situation, which includes being autonomous to some extent or being able to control your own life" (p.578). Earlier, O'Brien and O'Brien (1990) defined community participation as being present in everyday settings and involved in various adult activities, as well as being part of a network of personal relationship. Community participation can be measured through quantitative (i.e., frequency of activities, usage of community resources) or qualitative aspects (i.e., quality of interactions). O'Brien and O'Brien (1990) emphasized both aspects in their theoretical framework, the *Framework for Accomplishment,* by suggesting five areas of meaningful adult lives: (a) community presence, (b) choice, (c) community participation, (d) respect, and (e) competence. Their framework serves as the basis for this study, in which community participation is operationalized as: (a) community presence (i.e., being present in various community settings); (b) community activities (i.e., participating in community activities and having presumed adult roles); and (c) social engagement (i.e., engaging in a network of personal relationships).

Youth Domain. Developing skills of students has been a focus within secondary special education. Research has identified that a student's self-care and independent living skills are associated with postschool independent adult living (Test, Mazzotti et al., 2009). Thus, identification of evidence-based practices has been emphasized with regard to development of student skills. Recently, Shogren and Garnier Villarreal (2013) conceptualized student-level constructs using the NLTS-2 dataset: (a) academic grades, (b) classroom behaviors, (c) functional skills, (d) self-concept, and (e) social and communication skills. Morningstar and Trainor (2010) also included youth's postsecondary expectations in their model of adult life engagement for youth with high incidence disabilities; however, this study excluded the expectations of youth due to high rates of missing values. In this study, youth domain is defined

as individual-level characteristics: (a) functional skills, (b) social skills, (c) communication skill, (d) role in transition planning, and (e) classroom behaviors.

Family Domain. Family members play a consistent supportive role throughout a student's life (Morningstar, Turnbull, & Turnbull, 1995). Research supports that parental involvement was associated with positive postschool outcomes of students (Devlieger & Trach, 1999; Lindstrom, Doren, Metheny, Johnson, & Zane, 2007; Wagner et al., 2003). In addition, parental expectations have been associated with the achievement of successful postsecondary goals (Carter, Austin, & Trainor, 2012; Doren, Gau, & Lindstrom, 2012; Newman, 2005). Morningstar and Trainor (2010) considered parent involvement and postschool expectations of their child as predictors of adult life engagement, and investigated it in relation to graduation, community living, employment, and postsecondary education. Similarly, parent involvement has been conceptualized as family contextual factors associated with development of self-determination skills using variables from the NLTS-2 dataset (Shogren, Villarreal, Dowsett, & Little, 2014). For this study, family domain is defined as: (a) parent involvement in education, (b) parent outcome expectations, and (c) family support.

School Domain. Generally for all youth with disabilities, in-school experiences (e.g., paid work experiences, community experiences, career awareness, inclusion in general education) have been widely believed to be essential for a successful transition to adulthood (Test, Mazzotti, et al., 2009). Morningstar and Trainor (2010) conceptualized school factors, as one predictor of adult life engagement, as access to school programs and transition education services: (a) involvement in transition planning, (b) special education programs and services, (c) academic programs and services, and (d) transition educational programs and services. Recently, Shogren and Garnier Villarreal (2013) developed school level constructs across seven areas: (a)

access to the general curriculum (academics), (b) access to general curriculum (accommodations and modifications), (c) inclusion, (d) social networks, (e) supports, (f) student involvement in educational planning, and (g) vocational experiences. Based on the identified conceptualization of school level factors using the NLTS-2, this study defines school level domain as opportunities youth received during school, across five aspects: (a) inclusion, (b) access to the general curriculum, (c) accommodations/modification, (d) access to social networks, and (e) access to vocational programs.

Community Domain. The ICF emphasized the impact of environmental factors on all components of an individual functioning and disability. As such, environmental factors are defined as the physical, social, and attitudinal environments in which people live and conduct their lives (WHO, 2001). These factors could be facilitators or barriers to outcomes of students with disabilities. Indeed, community types, resources, and economic climate have been identified as a critical factors in designing and implementing transition programs and services (Baer, Daviso, McMahan Queen, & Flexer, 2011; Benz, Lindstrom, Unruh, & Waintrup, 2004; Hall & Hord, 2001). Carter and colleagues (2011) included community contextual components from the NLTS-2 data in their analysis of employment outcomes of youth with significant disabilities. For this study, community level domain includes the community environment in which the youth lives: (a) types of community, (b) accessibility to community, and (c) accessibility of transportation in the community.

Methodological Approach

This study is based on extant data from the National Longitudinal Transition Study-2 (NLTS-2). A descriptive picture of the level of community participation across three constructs (i.e., community presence, community involvement, and social engagement) was reported using

cross tabulation analysis. A multidimensional item response theory was used to establish the community participation outcome constructs and predictor constructs in the four domains (i.e., youth, family, school, and community domain). Once the constructs were established, a latent regression analysis was conducted to measure the significance of the predictive relationship between predictor constructs and outcome constructs. In addition to the predictive paths among outcome and predictor constructs, covariates (i.e., gender, race/ethnicity, and socioeconomic status) were considered to investigate the degree of their impact to the community participation of youth with significant disabilities.

Significance of the Study

Effective transition services can expand the expectations of youth with significant disabilities to consider meaningful adult life. Without careful planning, these youth face lifelong under-employment in segregated settings, limited access to community, and restricted relationships with others (Certo et al., 2009). Determining a multidimensional view of adult community participation proposed here will offer a robust understanding of one of the most important postschool outcomes that goes beyond research currently reported. Identifying the predictive relationships of adult community participation will set a marker within special education research for the enhancement of transition practices and programs leveraging positive outcomes. This analysis will reveal specific factors influencing outcomes both positive and negative. From these results, developing interventions promoting adult life engagement; as well as policy guidance to deter inhibitive practices can be achieved, particularly for youth with significant disabilities. Using multidimensional item response theory approach, the results will extend current conversation about predictors for postschool success.

Chapter 2. Literature Review

In the following chapter, critical components of community participation among youth with significant disabilities are discussed. First, prior research examining postschool outcomes of youth with significant disabilities is presented. A lack of research investigating community participation outcome is described. Second, the notion of community participation is highlighted as one of critical postschool outcomes of youth with significant disabilities. The "Framework for Accomplishment" is introduced emphasizing community participation (O'Brien & O'Brien, 1990), including issues related to community participation among youth with significant disabilities are described. Third, studies examining predictors relevant to successful community participation outcomes are reviewed across youth, family, school, and community domains. Last, a review of background information on youth with significant disabilities provides the context for the present study regarding school experiences and challenges, best instructional practices, and diagnostic criteria.

Postschool Outcomes of Youth with Significant Disability

The ultimate goal of education is to prepare individuals to achieve their full capacities, including engaging in meaningful and satisfying lives, forming social relationships, and contributing to society. In fact, the goal of special education as stated in the Individuals with Disabilities Education Improvement Act (IDEA, 2004), is to prepare students for adulthood by ensuring equality of opportunity, full participation, independent living, and economic self-sufficiency. A well-developed transition plan and implementation of transition services is imperative to support students with disabilities to engage in the community and accomplish their full potential. The most recent reauthorization of IDEA (2004) defined transition services as requiring a coordinated set of activities to promote movement from school to postsecondary

education, vocational education, integrated employment (including supported employment), continuing and adult education, adult services, independent living, and community participation (20 U.S.C. 1401(34)). Transition services must be based on the student's needs, taking into account the strengths, preferences, and interests. Transition services include training and education, related services, community experiences, and development of employment and other post school adult living objectives. By the age of 16 years old, the transition services and linkage with other agencies must be included in individualized education programs (IEPs). Therefore, while students with disabilities remain in public school systems, they learn skills necessary to pursue post-high school employment, education, and community activities.

Most often, students with significant disabilities are served in public school systems through the age of 21 or 22 years old, while their peers with mild disabilities and those without disabilities move on to college, employment, or other adult roles around 18 years old. For a seamless transition from school to adulthood of students with significant disabilities, collaboration is critical among the public schools, rehabilitation systems, and services for individuals with developmental disabilities (Certo et al., 2009). After students exit school, rehabilitation and developmental disabilities systems are the primary service providers to support their long-term and complex needs. Nonetheless, they have experienced difficulties in accessing appropriate supports and services, with many still on waiting lists for services (Rogan, Luecking, & Grossi, 2007). Too often, young adults with significant disabilities transition to segregated environments such as sheltered workshops, day activity centers, or remain at home (Braddock et al., 2005; Butterworth, Gilmore, Kiernan, & Schalock, 1999; Murphy, Rogan, Handley, Kincaid, & Royce-Davis, 2002; Rizzolo, Hemp, Braddock, & Pomeranz-Essley, 2004). For example, Bouck (2012) found a majority of students with significant disabilities were educated in

segregated school settings. A consistent finding identified in another study was that half of youth with significant disabilities worked in segregated work setting (Carter et al., 2012). Many factors contribute to these disappointing results: a shortage of stable federal or state funding, disjointed systems due to a lack of collaboration, low expectation toward students with significant disabilities, and insufficient skills prepared pursuing meaningful adulthood roles (Grigal, Neubert, & Moon, 2005).

Studies over time have mentioned that meaningful adulthood outcomes of youth with significant disabilities have remained elusive (Blackorby & Wagner, 1996; Wagner et al., 2005). In fact, students with significant disabilities have continued to experience poor postschool outcomes as compared to both peers without disabilities, as well as all other categories of youth with disabilities (Newman, Wagner, Cameto, & Knokey, 2009; Newman et al., 2010; Newman et al., 2011). Specific postschool outcomes in the areas of employment as well as other adult outcomes, are described next.

Employment. Few studies have specifically investigated postschool outcomes of students with significant disabilities, and among those that have, the focus has been primarily in the area of employment (Bouck, 2012; Brown, Shiraga, & Kessler, 2006; Carter, Austin, & Trainor, 2012). According to the recent review of data from the National Longitudinal Transition Study-2 (NLTS-2), young adults with significant disabilities are the least less likely to be employed; and work fewer hours when employed than youth with a wide range of other disabilities (i.e., 25-28 hours vs. 34-38 hours per week, Newman et al., 2011). In addition, their earnings on average are less than their peers with other disabilities (i.e., $7.90 vs. $10.50-$11.10 per hour, Newman et al., 2011). Despite poor employment outcomes, Brown and colleagues (2006) discovered that professionals' support (e.g., job coach), environmental accommodations,

and adaptation of work tasks are critical factors necessary for success on the job. These authors also emphasized the positive impact of integrated employment. As such, workers with significant disabilities engaged in social interactions with coworkers during naturally occurring opportunities (e.g., at lunch). However, recent data was reported that transition and IEP goals are often focused on working in sheltered employment. Therefore, the goals relevant to competitive and integrated employment are less likely to be identified for this particular group (Shogren & Plotner, 2012).

Other adulthood outcomes. Especially for youth with significant disabilities, few studies have examined other important adulthood outcomes, such as postsecondary education, independent living, and community participation. The NLTS-2 data has indicated that these outcomes are poor. Specifically, youth with significant disabilities are least likely to attend postsecondary settings from among youth with a wide range of other disabilities (29-33% vs. 61-75%, Newman et al., 2011). Additionally, Shogren and Plotner (2012) identified that IEP goals of students with intellectual disabilities and autism were more likely to be focused on functional independence; and less likely to be related to postsecondary education. With regard to independent living, few young adults lived independently when compared to those with learning disabilities, emotional disturbances, or speech/language impairments (16-36% vs. 51-65%, Newman et al., 2011). In this same report, when it comes to community involvement, youth with multiple disabilities were least likely to see friends informally (53-58%) compared to youth groups with mild disabilities (75-84%). Almost 80% of youth with learning disabilities had driving privileges, while only between 23 to 53% of youth with significant disabilities had a driver's license or permit (Newman et al., 2010).

Overall, adult success of youth with significant disabilities has been simplified to mostly focusing on employment, instead of examining the multiplicity of other postschool outcomes. Furthermore, this perspective extended to a narrowed perspective given that most of the evidence-based practices and predictors are related to successful employment outcomes; and few have been explicitly explored community participation outcomes (Test, Fowler, et al., 2009; Test, Mazzotti, et al., 2009). To better understand the unique transition needs among this specific low incidence population and align school experiences with the demands of successful adult life, a balanced perspective of adulthood outcomes should be explored. Most importantly, community participation outcome should be examined given the paucity of research evidence. Two studies that proposed a multi-construct model of adult life engagement can be used as a foundation of exploration of community participation outcomes for youth with significant disabilities (Halpern, 1993; Morningstar & Trainor, 2013). Specifically, Halpern (1993) stressed a performance of adult roles to improve quality of life of students with disabilities. For example, adult roles include being employed, engaging in personal relationships, accessing to community, participating in leisure activities, being enrolled in postsecondary education, and possessing citizenship. Morningstar and Trainor (2013) emphasized both community participation and social relationships outcomes, which refer to community involvement, voter registration, volunteering, driver's license, social activities, friendship, and reliance on others. In the next section, the notion of community participation is described as one a critical postschool outcome for youth with significant disabilities.

Community Participation of Youth with Significant Disabilities

Full integration in the community is a major goal of education. Individuals with disabilities who live in the community have more resources and opportunities to fulfill desired

adult roles, such as belonging to a community network, and expanding relationships with others. O'Brien and Blessing (2011) defined "community" as a place to live and work, but also to build common interests and connections. Community participation represents not only a physical presence but meaningful involvement in life activities. Common values associated with community participation include: choice and control, access and opportunity, responsibility and contribution, meaningful engagement, and social networking (Greenwood, 1987; Hammel, et al., 2008; Hewitt, Emerson, & Stancliffe, 2013; Levasseur, Desrosiers, & Whiteneck, 2010; Rogan & Walker, 2007). Earlier, Myers and colleagues (1998) described community participation as a process by which various adulthood goals can be achieved. In addition, the IDEA (2004) emphasizes community participation as an essential goal of education that ensures equality of opportunity, full participation, independent living, and economic self-sufficiency.

Theoretical models of human functioning also have considered community participation as a critical dimension of human functioning including: the International Classification of Functioning, Disability, and Health (ICF) of World Health Organization (WHO, 2001), and the definition of intellectual disability by the American Association on Intellectual and Developmental Disabilities (AAIDD, Schalock et al., 2010). This reflects a shift in perceptions of disability from the intrapersonal to social-ecological approach, viewing disability as a phenomenon deriving from interactions between the individual and society. Specifically, the ICF considered human functioning and disability as an interaction among individual conditions (e.g., disease, disorders, injuries, activities, and participation) and contextual factors such as the environment. Participation is defined as being included, accepted, and engaged in primary areas of adult life, with access to supports and resources needed (Bruyere, 2005; Moller & Danermark, 2007). Beyond the physical meaning of participation, Perenboom and Chorus (2003) expanded

the definition of participation by emphasizing choice and control: “involvement in a life situation, which includes being autonomous to some extent or being able to control your own life (p.578)”.

Accordingly, a theoretical framework of community participation has been discussed in the literature. In the ICF framework, community participation is aligned across four major domains: (a) domestic life, (b) interpersonal life (i.e., formal, informal, family, intimate relationships), (c) major life activities consisting of education and employment, and (d) community, civic, and social life (i.e., religion, politics, leisure, arts and culture). Literature summarizing common characteristic of framework of community participation has included: (a) being accepted as an individual and a member of community beyond the disability; (b) being involved in activities and contributing to society; (c) being respected and having reciprocal personal relationships; (d) sharing ordinary places and activities; and (e) receiving formal and informal supports (Hall, 2009; O’Brien & Blessing, 2011). Recently, Martin and Cobigo (2011) proposed five domains of social inclusion: (a) relationship, (b) leisure, (c) productive activities, (d) accommodations, and (e) information support.

In 1990, O’Brien and O’Brien proposed a “Framework for Accomplishment” which referred to community participation being present in everyday settings and involved in various adult activities; as well as being part of a network of personal relationships. Their framework extended the meaning of adult outcomes of individuals with disabilities by emphasizing participation in community, and used the framework to gauge the level of community participation (Walker & Rogan, 2007). The theoretical framework described meaningful adult lives across five areas: (a) community presence, (b) choice, (c) community participation, (d) respect, and (e) competence. Community presence was defined as being in ordinary community

settings typically shared by others. O'Brien and O'Brien emphasized that presence in integrated community places is a precondition of achieving meaningful adult lives. They highlighted that having sufficient choices and opportunities for decision-making is imperative to guide one's life independence and fully engage in community. Beyond a presence in community, community participation refers to involvement in adult activities and engagement in a social network. Becoming a member of community, joining community organizations, and using community services are examples of community participation. Furthermore, gaining respect through having valued adult roles in society is one important factor that characterizes meaningful adult lives. Later, O'Brien further defined the concept of respect as contributing to others by sharing one's capacities with others, such as those associated with presumed adult roles (O'Brien & Blessing, 2011). The last factor in this Framework for Accomplishment is competence, which indicates an individual's abilities and skills to perform activities in various life situations. Even though meaningful adult life could vary from person to person based on one's preferences and needs, this framework built a foundation in this field to examine community participation across several dimensions.

Research relevant to community participation has mostly been descriptive in nature. Most studies has focused mainly on individuals with mild disabilities, with few reported studies for significant disabilities (Cleaver, Ouelette-Kuntz, & Sakar, 2010; Verdonschot, Witte, Reichrath, Buntinx, & Curfs, 2009). Especially for individuals with significant disabilities, the meaning and degree of community participation is more difficult to ascertain. It may be misinterpreted because preferences or perspectives are mostly by family members or staff (Clement & Bigby, 2009). Often, individuals with significant disabilities are found to be more vulnerable to social exclusion, with society assumptions that they are not able to have similar lives as their same age

peers. In the next section, issues associated with community participation are described across three areas: (a) measurements used to gauge the level of community participation, (b) barriers and obstacles reported for full participation in the community, and (c) instructional strategies suggested to promote community participation.

Measuring the level of community participation. Community participation has been used interchangeably with other terms, such as inclusion and integration. Researchers have not clearly defined its meaning, particularly with regard to the attributions of successful participation (Verdonschot et al., 2009). Despite clear emphasis within the ICF framework, development of a measure to gauge degree of social inclusion and community participation has been a point of debate (Dijkers, 2010; Noreau et al., 2004; Perenboom & Chorus, 2003; Whiteneck & Dijkers, 2009). Conroy, Fullerton, and Brown (2002) described three metrics to gauge level of community participation: frequency, choice, and intensity. A quantitative approach to measuring community participation most often uses frequency and types of activities. For example, Clement and Bigby (2009) specifically observed the frequency of community visits of men with intellectual disabilities who moved to group homes from the institutions, such as if they have been to various community service places (e.g., theater, library, shop, restaurant).

The qualitative aspect of community participation is more difficult to measure, given that community experiences are so individualized and dependent on personal and psychological factors such as individual preferences and satisfaction. Therefore, self-reported satisfaction has been an indicator of successful community participation. For example, Milner and Kelly (2009) found that increased levels of community presence was not always associated with improved life satisfaction of individuals with intellectual disabilities. These researchers advocated that personal factors among individuals should be considered. For instance, adults with intellectual disability

who participated in this study defined "social inclusion" as becoming community members by having social roles and feeling social acceptance.

Barriers and obstacles of community participation. A sense of belonging has been associated with many personal and environmental factors (Chipuer et al., 1999; Jason, 2006; Pretty, Andrews, & Collett, 1994; Pretty, Conroy, Dugay, Fowler, & Williams, 1996; Robinson, Matsuda, Ciol, & Shumway-Cook, 2013). For example, Levasseur and colleagues (2010) found that individuals with disabilities tended to experience a reduction in the frequency of social contacts with friends and family members as they aged. In addition, individuals with higher activity levels were more likely to report greater satisfaction with their social participation. These authors also found that psychological factors have been associated with a sense of belonging. Individuals with disabilities who felt a greater sense of belonging perceived higher levels of happiness and satisfaction in their lives. In another report that used the Intellectual Disability Supplement to the Irish Longitudinal Study on Ageing (IDS-TILDA), McCarron and colleagues (2011) discovered that individuals with intellectual disabilities experienced difficulties in making friends when they felt lonely. These authors mentioned that when there is a greater level of social acceptance, individuals with disabilities were able to report a stronger sense of belonging in the community.

Researchers have found obstacles impeding community engagement. Milner and Kelly (2009) reported that adults with disabilities commonly reported being isolated and marginalized from the society, saying that "It is a community, but it is a closed community. We are all closed into one big room (p.54)" The barriers and obstacles of community participation are categorized across three levels: intrapersonal, interpersonal, and organizational (Radermacher, Sonn, Keys, & Duckett, 2010). First, individuals with disabilities often experience social exclusion because of

a lack of skills due to their disability. Specifically, Orsmond and colleagues (2013) identified intrapersonal barriers among youth with autism spectrum disorder. Compared to youth with learning disabilities, intellectual disabilities, and emotional and behavioral disorders, students with autism were less likely to see friends, get called by friends, and be invited to activities or events. Individuals with significant disabilities commonly experience difficulties in building and maintaining social network because of an insufficient reciprocity required to maintain friendships (Kennedy et al., 1989; Kobayashi & Murata, 1998; Howlin, 2000). In addition, the severity of the disability has been related to the quantity and quality of participation in leisure activities (Abells, Burbidge, & Minnes, 2008; Baker, 2000; Bray & Gates, 2003; Devine, Malley, Sheldon, Dattilo, & Gast, 1997; Zijlstra & Vlaskamp, 2005). Badia and colleagues (2011) identified interpersonal barriers due to the severity of disability as interfering in leisure activities of youth with developmental disabilities. Dependence on others resulted in limited participation in leisure activities, eventually leading to social exclusion. Additionally, these authors mentioned the negative attitudes of society. For instance, youth tented to engage in leisure activities when they felt not being afraid of teasing from others. Last, societal lowed expectations toward individuals with disabilities blocked active participation. McCarron and colleagues (2011) found that a lack of organizational infrastructure such as public transportation or assistance to community activities, resulted in greatest barriers to successful community participation.

Instructional strategies for community participation. While most of research has been descriptive focusing on obstacles and barriers, a few studies have reported strategies and methods promoting social inclusion. In the 1980's and 1990's, community-based instruction was promoted to teach students with disabilities functional and daily living skills as a strategy to increase community activities (Sailor, Wilcox, & Brown, 1980; Snell, 1982; Sowers & Powers,

1995; Wilcox & Bellamy, 1982). For instance, Sowers and Powers (1995) designed community-based instruction to teach skills needed to use fast food restaurants. Another recent study instructed household skills in home settings. Harr, Dunn, and Price (2011) found that youth with multiple disabilities increased independence of household responsibilities as well as increased participation in community. Additionally, these authors mentioned that becoming independent both at home and community was closely associated with increased self-regulation and self-determination skills, and also impacted parent's positive perception toward the youth's disability and future life.

Overall, given the importance of community participation, there has been insufficient research. Most research relevant to community participation has been descriptive, and focused on individuals with mild disabilities. The "Framework for Accomplishment" (O'Brien & O'Brien, 1990) provides a foundation of examining adult outcomes based on the importance of community participation. As these authors mentioned, recognizing citizenship is essential to understanding and supporting individuals with significant disabilities to be members of society and develop a sense of belonging and willingness to act with responsibility. The present study is based on an adopted version of the O'Brien and O'Brien theoretical framework by conceptualizing three areas: community presence, involvement, and social engagement as constructs of community participation for young adults with significant disabilities.

Predictive Factors Relevant to Community Participation

Generally for all youth with disabilities, in-school experiences (e.g., paid work experiences, community experiences, career awareness, inclusion in general education) and parent and student postschool expectations have been widely believed to be essential for successful and meaningful outcomes (Test et al., 2009). Research has identified potential factors

associated with postschool community participation for youth with significant disabilities (Bouck, 2010; Wehmeyer & Palmer, 2003), although none have yet been identified as having a causal relationship. Variables previously examined as relevant to independent living outcomes, such as student demographics, student skills, and school program characteristics (Test, Mazzotti, et al., 2009) are considered as also relevant to community participation. These youth, family, school, and community factors are discussed next.

Youth factors. Educational research have been largely focused on developing the skills need for students with disabilities to prepare for adulthood. Test, Fowler and colleagues (2009) identified seventeen evidence-based practices specifically related to independent living skills, and six specific to employment. As students developed skills in major life areas, they are more likely to maintain productive and worthwhile adult lives. In fact, early research noted that students with higher self-determination skills, self-care skills, daily living skills, and social skills are more likely to be engaged in successful postschool outcomes including enrollment in postsecondary schools, independent living, and paid employment (Blackorby, Hancock, & Siegel, 1993; Heal & Rusch, 1994; Roessler, Brolin, & Johnson, 1990; Wehmeyer & Schwartz, 1997). Test, Mazzotti, and colleagues' (2009) systematic review identified daily living and self-care skills as predictors of independent living. Others have found that youth who were more engaged in social interactions with friends or family were more likely to possess a higher quality of life (Heal, Khoju, Rusch, & Harnisch, 1999).

Moreover, several studies using the NLTS-2 have indicated youth skills such as functional cognitive, self-care, household responsibility, and social are all predictors of successful postschool outcomes (Carter, Austin, & Trainor, 2012; Rojewski, Lee, & Gregg, 2013; Shattuck, Orsmond, Wagner, & Cooper, 2011; Shogren, in press). For example, youth with

significant disabilities with stronger communication and self-care skills are more likely to obtain postschool paid employment (Carter, et al., 2011). Similarly, Shattuck and colleagues (2011) found that youth with autism who demonstrated higher levels of social communication skills were more likely to participate in social activities.

The importance of self-determination skills has been widely emphasized (Halpern, Yovanoff, Doren, & Benz, 1995; Wehmeyer & Palmer, 2003). Self-determination is referred to "volitional actions that enable one to act as the primary causal agent in one's life and to maintain or improve one's quality of life" (Wehmeyer, 2005, p.117). Students who are self-determined know what they want and need to accomplish their goals (Wehmeyer & Schwartz, 1997). Researchers have identified that self-determination is a key factor leading to educational achievement and meaningful adult roles that enhance quality of life (Turnbull & Turnbull, 2001; Wehmeyer & Field, 2007). Studies have shown a positive impact of self-determination and self-advocacy skills on postsecondary education and employment outcomes of youth with disabilities (Halpern, et al., 1995; Wehmeyer & Schwartz, 1997). Despite a lack of empirical evidence of self-determination promoting community participation, it is worthy to note that in a recent study, Shogren and Villarreal (2013) included several items related to self-confidence in academic and social domains to conceptualize student constructs from the NLTS-2 dataset.

Family factors. Family members spend considerable time with their child and know more than anybody else about their child. They provide information and insights about the child as well as play a critical role in supporting the education of their child. Family members provide lifelong support throughout the lives of youth with disabilities, especially during the transition to adulthood (Morningstar, Turnbull, & Turnbull, 1995). Needless to say, family member involvement in transition is essential. Current research evidence has identified that parental

expectations positively influence postsecondary goals (Doren, Gau, & Lindstrom, 2012; Newman, 2005; Thompson, Fulk, & Piercy, 2001). When family members are actively involved in education, youth tend to achieve successful adult roles (Lindstrom et al., 2007; Wagner, et al., 2003); and are more likely to be engaged during transition IEP meetings, as well as have high self-determination skills (Defur, Todd-Allen, & Getzel, 2001; Morningstar et al., 2010).

Active parental involvement in school-related activities and positive expectations of their child's future were more likely to predict enrollment in postsecondary education and paid employment (Barnard-Brak & Fearon, 2012; Carter et al., 2011; Devlieger & Trach, 1999; Rojewski, Lee, & Gregg, 2013). Doren and Benz (1998) found that family member support of youth was associated with higher engagement in employment. Studies that focused on youth with significant disabilities showed that parents who possessed higher expectations for obtaining a job or becoming self-supported, were more likely to lead to paid employment (Carter et al., 2012). Another study of students with significant disabilities identified that parental satisfaction with involvement in transition planning was associated with attainment of positive postschool outcomes (Neece, Kraemer, & Blacher, 2009). The relationship of parental expectation with attainment of community participation has not been sufficiently addressed, but evidence suggests variables that might also be related to positive community participation outcomes. The importance of conceptualizing parental expectations has been emphasized in several studies using the NLTS-2 dataset (Morningstar & Trainor, 2010; Shogren & Villarreal, 2013).

School factors. Most predictors associated with successful postschool outcomes has targeted school-related factors (Test, Mazzotti, et al., 2009). Above all, inclusion in general education has been identified as a critical predictor of adult outcomes including postsecondary education, employment, and independent living (Baer et al., 2003; Heal & Rusch, 1995; White &

Weiner, 2004). Specifically, as students participated in highly integrated school environments, and spent more time in general education classrooms taking academic courses, they are more likely to obtain meaningful adult roles. The importance of considering inclusion in general education has been emphasized in several studies using NLTS-2 (Morningstar & Trainor, 2010; Shogren & Garnier Villarreal, 2013).

Several job-related components of school programs have been recognized as predictors of postschool employment. Transition-focused programs, such as the School to Work Transition Program, Youth Transition Program, and Bridges from School to Work that focused on job-specific skills have been found to youth's postschool job outcomes (Benz et al., 1997; Benz et al., 2000; Luecking & Fabian, 2000). In addition, enrollment in vocational courses and school-sponsored enterprise programs have influenced postschool employment (Halpern et al., 1995; Shandra & Hogan, 2008).

Interagency collaboration also has been identified as a critical component of transition planning (Kohler, 1996). Research has shown that youth who are linked to community-based agencies or school-business partnerships have positive impact on career development, as well as in attainment of postsecondary education and employment (Bullis, Davis, Bull, & Johnson, 1995; Carter, Trainor, et al., 2009). In addition, community-based transition programs including on-the-job training have influenced higher rates of postschool employment (White & Weiner, 2004).

For youth with significant disabilities, employment rates and paid work experiences have been impacted by high quality school-sponsored access to inclusive environments (Migliore, Mank, Grossi, & Rogan, 2007). Vocational IEP goals and paid work experiences while in high schools are positively associated with being engaged in postschool employment (Carter et al., 2011; 2012). However, not all youth are sufficiently served in transition-related school programs.

In fact, only a small portion of youth access paid work experiences during school. Carter and colleagues (2012) found that one-third of youth with significant disabilities did not have any vocational goals in their IEPs. In addition, there is a paucity of plentiful research that investigated the relationships between school-related factors and youth's postschool community participation outcome.

Community factors. As the importance of environmental factors influencing human functioning and disability are emphasized (WHO, 2001), researchers have begun to note how school and community contexts impact transition planning and services. In the ICF framework, the environment includes physical, social, and attitudinal factors associated with where people live and conduct their lives. Thus, environmental factors may be as critical as individual factors for understanding and supporting the daily functioning of individuals with disabilities. Community factors could facilitate an individual's integration in the community.

Research has identified that school and community contextual factors have influenced how transition programs are implemented including school policies, geographic location, economic climate, and cost and benefits of programs (Baer et al., 2011; Benz et al., 2004; Hall & Hord, 2001). Descriptive studies have shown that the geographic location of schools (e.g., rural, suburban, or urban areas) make a difference with regard to educational experiences of youth with disabilities (Arnold, Newman, Gaddy, & Dean, 2005; Baer et al., 2003; Baer et al., 2011; Fabian, 2007; Lee & Morningstar, in development). For instance, urban schools were more likely to focus on academic programs compared to the schools in rural areas. Youth with disabilities who lived in rural areas were more likely to be educated in career-related transition programs than urban and suburban areas.

Taken together, little research has investigated the impact of community factors on postschool outcomes. Benz and colleagues (2004) found strong collaboration with community adult services providers and consistent administrative supports promoted positive postschool outcomes of youth with disabilities. These appeared to be related to school experiences than community factors. Carter and colleagues (2011) considered community contextual components—community types, and availability of public transportation—as possible predictors of postschool paid employment outcomes. Availability of transportation for people with disabilities was significantly associated with paid work experience after high school. No research has been conducted regarding to what degree community contextual factors are associated with community participation of youth with significant disabilities.

Background on Youth with Significant Disabilities

Historically, individuals with significant disabilities have often been marginalized in society. Institutions continued to increase in size during the 1900s, and became asylums that dehumanized rather than educated individuals with disabilities (Karan & Greenspan, 1995). This segregation remained throughout the 1950s, but community integration surged with paradigm changes, placing the value on social equity and inclusion. By the 1960s, a strong national movement of parents of individuals with disabilities accelerated the shift in public attitudes away from a medical approach to a social justice approach emphasizing self-determined and self-advocacy (Ericsson, 2002; Keys & Dowrick, 2001; Taylor, Bogdan, & Racino, 1991; Wehmeyer, 2013). During the same time period, concepts associated with normalization grew worldwide.

The notion of normalization emerged in the late 1950s, referring to "patterns and conditions of everyday life for people with disabilities should be as close as possible to sociocultural norms" (Nirje, 1969). In the United States, Wolf Wolfensberger expanded the

framework and introduced the concept of social role valorization focusing on transforming individuals with disabilities from devalued to valued members of society (Wolfensberger, 1972; 2002). Followed by parent and civil rights movements, nationwide empowerment movements were activated, including the independent living movement started in the 1970s and the self-advocacy movement in the 1980s. Concurrent with critical social movements, legislations and policies at federal, state, and local levels moved toward ensuring equal rights and access to social and education services. Next, issues related to individuals with significant disabilities are describe as: (a) school experiences and challenges, (b) effective practices, and (c) diagnostic criteria to define youth with significant disabilities.

School experiences and challenges. Individuals with significant disabilities have been marginalized within educational systems. A recent statistics from the U.S Department of Education (2013) shows that a lower percentage of students with significant disabilities ages 3-21 received special education services under the Individuals with Disabilities Education Act (IDEA), compared to more than two third of students with learning disabilities and speech impairments. Specifically, students with intellectual disabilities and autism each accounted for 7% of children and youth served under the IDEA, and students with multiple disabilities and deaf-blindness for 2% or less. In addition, students with significant disabilities are predominantly segregated in terms of educational environment placement, with only 10-40% of students with intellectual disabilities, autism, multiple disabilities, and deaf-blindness included in 80% or more of their general education classes compared to 60 to 90% of students with learning disabilities and speech impairments. Notably, a higher percentage of students with autism, deaf-blindness, and multiple disabilities were educated in separate schools or residential facilities than any other disability categories.

For a long time, schools have reported the difficulties in meeting diverse and complex needs of this group of students who have significant disabilities (Snell & Brown, 2006). Previously, school curriculum was derived from a developmental approach teaching sequential skills based on developmental stages. School focused on curricula that developmentally aligned with skills, regardless of chronological ages (Brown et al., 1979). As students matured, the discrepancies in acquisition of developmental skills escalated compared to students without disabilities and of the same chronological ages. In early 1970s, Lou Brown and colleagues proposed a curriculum for students with significant disabilities that emphasized teaching chronological age-appropriate functional skills in natural environments. Functional skills in the areas of home, vocational, and community were taught students aligned to chronological ages in order to prepare to function and live in natural environment.

Effective practices for youth with significant disabilities. Current studies support a continued emphasis on functional skills for students with significant disabilities. Using the NLTS-2 data, it was found that students with intellectual disabilities or autism were more likely to have IEP goals related to functional independence and social skills, while the goals relevant to employment or postsecondary education were less likely to be included (Shogren & Plotner, 2012). Bouck (2010) found that the frequency of engaging in a functional curriculum was higher for students with significant intellectual disabilities compared to students with mild intellectual disabilities. In addition, the majority of students with severe intellectual disabilities receiving functional curriculum were in segregated instruction in educational environments other than the regular classrooms (71% vs. 29%; Bouck, 2012). Focusing on functional curriculum may seem a proper approach to prepare students with significant disabilities to obtain meaningful adult lives, but the current data indicates continued segregated outcomes.

Over the past three decades, education emphasizing meaningful transitions from school to adult lives has developed. Effective instructional practices to prepare students with significant disabilities to achieve worthwhile adult lives have been developed. One such instructional practice is inclusive education. Research indicates that when students with significant disabilities were educated with their same age peers, they were more likely to engage in age appropriate activities, as well as learn skills such as being aware of proper attitudes, language, or gestures (Bennett, Deluca, & Bruns, 1997; Brown et al., 1983; Fisher, Roach, & Frey, 2002; Grossi, & Cole, 2013). Access to the general education classroom and curriculum has had positive impacts on improved academic achievements and development of friendships (Holahan & Costanbader, 2000; Kluth, Straut, & Biklen, 2003). A collaborative team effort among school professionals has promoted inclusive education by designing supportive plans to ensure inclusive practices (Elllingson, Miltenberger, Stricker, Galensky, & Garlinghouse, 2000; Salisbury, Evans, & Palombaro, 1997).

Person-centered planning has been widely recognized as an effective transition practice, which focuses on strengths and needs as a way of achieving desired adulthood outcomes (Everson, 1996; Kim & Turnbull, 2004; O'Brien & O'Brien, 2002; Rasheed, Fore III, & Miller, 2006). Because person-centered planning is strengths-based, it has been found to impact students especially in the early stage of employment (Menchetti & Carcia, 2003; Weir, 2004). Unfortunately, the current data showed that students with intellectual disability or autism were least likely to be attended in their transition meetings (Shogren & Plotner, 2012). In this case, person-centered planning tools, such as MAPS (Vandercook, York & Forest, 1989), Personal Futures Planning (Mount, 1987), Group Action Planning (Turnbull & Turnbull, 1996), and PATH (Pearpoint, O'Brien, & Forest, 1993), could support student participation and

contributions during planning (Michaels & Ferrara, 2005; Whitney-Thomas, Shaw, Honey, & Butterworth, 1998), leading to increased self-determined behaviors (Miner & Bates, 1997).

Defining youth with significant disabilities. The definition of individuals with significant disabilities is unclear throughout the legislature and even in the literature. The term, individuals with significant disabilities, broadly refers to the following disability categories: intellectual disability, autism, multiple disabilities, and deaf-blindness (Snell & Brown, 2006). Occasionally, other terms are used for this group, such as individuals with severe disabilities or low incidence disabilities. In the IDEA (2004), 13 categories of disability were defined, but none focused on the extent of severity of disability (autism, deaf-blindness, deafness, emotional disturbance, hearing impairment, intellectual disability, multiple disabilities, orthopedic impairment, other health impairment, specific learning disability, speech or language impairment, traumatic brain injury, and visual impairment). TASH, an international disability advocacy organization, defines the severity of disability by focusing on the level of support needs for integrated participation in the community as:

> Individuals with disabilities of all ages, races, creeds, national origins, genders, and sexual orientation who require ongoing support in one or more major life activities in order to participate in an integrated community and enjoy a quality of life similar to that available to all citizens. Support may be required for life activities such as mobility, communications, self-care, and learning as necessary for community living, employment, and self-sufficiency (Snell & Brown, 2006, pp. 69-70)

Given the variety of intellectual and functional abilities within a certain disability category, it has been a challenge for researchers to investigate the confounding effects of severity of disability on education and transition. The National Longitudinal Transition Study-2 (NLTS-

2) provides little information distinguishing the severity of disability of students (i.e., mild, moderate, or significant). Only the *School Program Survey* asked school personnel to distinguish whether students with intellectual disabilities had a mild or moderate/severe disability.

Another approach to students with significant disabilities has been to analyze their eligibility for taking the alternate assessments for academic achievements. Most states developed specific alternate assessment procedures according to the emphasis on the educational accountability for improved student performance from the 2001 reauthorization of the Elementary and Secondary Education Act, No Child Left Behind (NCLB). For students with significant disabilities who cannot participate in state or district-wide assessments, the NCLB allows them to participate in the alternate assessment with reasonable accommodations to ensure their full assessment participation (Thompson & Thurlow, 2003; Thurlow, Lazarus, Thompson, & Morse, 2005).

Researchers studying the NLTS-2 data have relied on specific measures to designate the severity of disability among students identified with intellectual disabilities and autism. Variables often considered to distinguish this group include: functional cognitive skills, self-care skills, social skills, home care skills, communication skills, general health, and having a personal assistant (Bouck, 2010; Shattuck, Orsmond, Wagner, & Cooper, 2011; Wei, Wagner, Christiano, Shattuck, & Yu, 2013). Others have depended on a composite measure of performance of functional cognitive skills (Carter, Austin, & Trainor, 2011; Yu, Newman, & Wagner, 2009). There are two studies that utilized systematic approaches classify students with significant disabilities. Wagner (2012) only focused on classification of students with significant intellectual disabilities using a rigorous statistical analysis. A multivariate regression analysis was conducted using 25 variables potentially related to severity of disability from among current literature (e.g.,

inclusion percentage, functional cognitive skills, social skills, heath, communication, personal assistant, expectation, self-determination, etc.).

In another study, Carter and colleagues (2012) adopted a systematic approach to identify students with significant disabilities from the NLTS-2 dataset. Three criteria were used to extend the primary disability category in an effort to identifying a sample. First, students with primary disability categories of intellectual disability, autism, or multiple disabilities were selected. The next step included students based on eligibility for the alternate assessment. If information about the alternate assessment was not included, then the researchers considered student performance of a set of functional skill variables. Specifically, students were considered as having significant disabilities if the students exhibited functional cognitive skill deficits in two or more areas: telling time, reading signs, counting changes, or using the telephone.

These two studies provided a framework to future researchers to designate the severity of disability among students with intellectual disabilities and autism. Taken together, it is still essential to thoroughly investigate the severity of disability to define which students can be classified as having significant disabilities given a paucity of studies. Therefore, based on these criteria identified throughout the literature, the present study conducted a comprehensive multi-stage sampling analysis.

Summary

Individuals with significant disabilities have often been marginalized in society, including in school. Accomplishment of typical adult outcomes has been challenging especially for youth with significant disabilities. However, research investigating meaningful adulthood outcomes of youth with significant disabilities has remained elusive. Few studies have examined multi-dimensional postschool outcomes of this population. Few among those have focused on

certain aspects of adulthood, such as employment. A "Framework for Accomplishment" proposed by O'Brien and O'Brien (1990) was introduced in this chapter that emphasized community participation as a critical component to maintain meaningful adult lives. The meaningful adult lives were described across five areas: (a) community presence, (b) choice, (c) community participation, (d) respect, and (e) competence. Individuals who live in the community and engage in social activities have more resources and opportunities to accomplish desired adult roles and expand relationship with others. Research relevant to community participation of youth with significant disabilities has been descriptive, and focused on barriers for fully integrated participation in the community. Give a paucity of research investigating predictors of successful postschool outcomes of youth with significant disabilities; potential youth, family, school, and community factors that may be associated with community participation outcome were addressed in this chapter. Last, issues relevant to defining individuals with significant disabilities were addressed to designate the severity of disability among students with intellectual disabilities, multiple disabilities, deaf-blindness, and autism.

Chapter 3. Methods

The purpose of this study was to examine adult outcomes for youth with significant disabilities related to community participation, and to also examine malleable factors (i.e., student, family, school, and community level factors) associated with improved community presence, community involvement, and social engagement. The study used a logical sequence of analyses to determine if youth, family, school, and community-level factors were more likely to influence community presence, engagement in community activities and roles, and stronger social relationships. The first analysis conducted was descriptive analysis of level of community participation using cross tabulations across three constructs: (a) community presence, (b) community involvement, and (c) social engagement. Second, multidimensional item response theory was used to establish the community participation outcome constructs as well predictor construct domains: (a) youth-level, (b) family-level, (c) school-level, and (d) community-level. Once the final models were confirmed, a latent regression analysis was conducted to measure the significance of the predictive relationship between predictor constructs and outcomes. In addition to the predictive paths, covariates (i.e., gender, race/ethnicity, and socioeconomic status) were considered to determine the degree of impact to community participation of youth with significant disabilities.

Participants

Identifying the sample of interest from the NLTS-2 dataset required a comprehensive multi-stage sampling analysis. Wave 1 data was compiled for participants aged 13 to 17 years old and enrolled in school. The sampling plan took into account characteristics across four disability categories—autism, deaf-blindness, intellectual disability, and multiple disabilities—all generally associated with significant disabilities (Snell & Brown, 2006).

First, youth were included who were identified from the original NLTS-2 sample plan from the categories of autism, multiple disabilities, deaf-blindness, and severe intellectual disability (*n* = 2880 students; all sample sizes have been rounded to the nearest 10). Because of the range of intellectual and functional capabilities within such broad categorical groups, a second criterion for sample inclusion was used if from the *School Program Survey* (SPS): (a) youth were assigned as having moderate/severe intellectual disability; or (b) youth were eligible for participating in the alternate assessment of academic achievement, given that this particular designation is intended only for 1% of the special education population for whom regular state assessments are not deemed appropriate (Carter et al., 2011; Wagner, 2012). This process resulted in the identification of 550 students with significant cognitive disabilities from the initial 2880, while excluding 560 students identified as having mild cognitive disabilities.

Due to the low response rate of the SPS, for the remaining 1770 students from the original sample for whom severity of disability could not be identified, a third criterion was added in which the severity of disability was estimated using a best-subset logistic regression analysis (BSA). The BSA identified all possible subset regression models, and then selected one or more best sets of variables (Hosmer, Jovanovic, & Lemeshow, 1989; Hosmer & Lemeshow, 2000; King, 2003). While a traditional step-wise logistic regression has been widely used to identify predictors, the downside of such an approach is the occurrence of Type I error due to an overstated p-value and inflated R^2 value (Rencher & Fu, 1980; Wilkinson & Gerard, 1981). The BSA selects a best model based on model fit statistics (i.e., Mallow's C_p, AIC, BIC). Using the BSA, 2^p-1 models are generated that represent all possible combinations of predictors (p = number of predictors). A good-fitting model is selected based on Mallow's C_p (i.e., Is the

Mallow's C_p, value equal to or less than p+1?). In addition, the lowest Akaike's information criterion (AIC) and Bayesian information criterion (BIC) values indicate the best model fit.

Thirty-one variables associated with severe disabilities were selected for the BSA analysis grounded on literature (Bouck, 2010; Carter et al., 2011; Shattuck et al., 2011; Wei et al., 2013; Wagner, 2012; Yu et al., 2009), and resulted in 2^{31}-1 = 2,147,483,648 models to analyze. Based on three model fit statistics, the best subset of predictors included six predictors: (a) percentage of time spent in academic general education classes; (b) straighten up his/her own room; (c) number of domains affected by disability; (d) belongs to extracurricular school group; (e) level of curriculum modification; and (f) parents' expectations the student will attend school after high school (see Table A1). Using these 6 predictors associated with severity of disability, the probability of having a significant disability from among the 1770 unidentified students was then estimated using regression coefficients with a cutoff value of .50 (or 50%) that is a typical cutoff value for the decision of predicting (Neter, Wasserman, Nachtsheim, & Kutner, 1996; see Table A2). Thus, students with a probability below .50 were excluded, and those with a probability above .50 were classified as having a significant disability. This step added 130 students with significant disabilities. As a result, a sample of 680 of students with significant cognitive disabilities was identified including: 170 students with a primary disability category of intellectual disability, 240 with autism, 240 with multiple disabilities, and 30 with deaf-blindness.

For this study, participants were selected if the youth met the following criteria: (a) identified as having a significant disability in Wave 1; and (b) were enrolled in school in Wave 2 and Wave 3, and out of school in Wave 4 and 5. This resulted in a total sample of 470 youth, 350

of whom graduated school by Wave 4 and 120 who graduated by Wave 5. Table 1 shows the demographics of the unweighted sample.

Human subject approval was sought and received from the Human Subjects Committee-Lawrence in October 1, 2012 (see Appendix B). Access to the database was secured through an affidavit submitted as a part of existing research examining the relationships between expectations, opportunities, and postsecondary engagement using the NLTS-2 database (license number R324A100275). The data is stored on a password-protected computer in a secured office. As required, due to restrictions to the database, the researcher successfully completed the

The National Longitudinal Transition Study Data Set

The National Longitudinal Transition Study-2 (NLTS-2) funded by U.S. Department of Education was designed to provide information about postschool outcomes of young adults with disabilities as they move from schools to adulthood (Valdes et al., 2006). The NLTS-2 provides a nationally representative sample of youth with disabilities 11,280, who were aged 13 to 16 years old as of December 1, 2000, and, who received special education services (SRI International, 2000). Data were gathered over 10 years in a series of five waves occurring every two years. Data were collected from multiple participants whom are from a constellation around the youth with disabilities (i.e., parents, teachers, other school personnel) through multiple sources (i.e., telephone interview, mailed survey, direct assessments).

First, *Youth Direct Assessment* was conducted in Waves 1 (2002) and 2 (2004) for those who were 16 through 18 years old. It measured reading comprehension, math skills, vocabulary, science and social studies content knowledge, self-concepts, and self-determination. For those whom the direct assessment is not appropriate (i.e., youth with sensory, physical, behavioral, or cognitive disabilities), a functional rating instrument, *Scale of Independent Behavior-Revised*

(SIB-R), was conducted. It measured functional independence and adaptive functioning in school, home, employment, and community settings. The SIB-R consists of four skill domains: motor, social interaction and communication; personal living; and community living skills.

Second, the *Parent-Youth Interview* was conducted at each wave of data collection across a total of five waves. Telephone interviews with parents/guardians were conducted to collect youth and family characteristics, non-school activities, satisfaction with school programs, and activities after high school. Youth were also interviewed if able to answer for themselves.

Third, the *School Program Survey* identified information about individual students' educational services and programs, transition planning experiences, school performance (e.g., absenteeism, disciplinary actions, overall grades), and instructional practices in special education, general education, and vocational education classes. School staff who were most knowledgeable about the students' overall school programs were asked to complete the survey.

In addition, school staff completed the *School Characteristic Survey* to identify the characteristics and policies of schools, such as grade levels serve, public or private, size, and number of students. Last, a *Transcript Analysis* was completed to collect data about course-taking patterns, grades, and attendance. According to the NLTS-2, all instruments were developed based on theoretical background, to ensure greater validity. Gathering data at different points in times established reliability of the instruments.

For this study, the participants were selected using variables in Wave 1 *Parent Interview, School Program Survey, and Transcripts*. Criterion variables were obtained from the *Parent-Youth Interview* in Waves 4 and 5, when participants were 19 to 25 years old and out of school at the time data was collected. Predictor variables were identified from the *Parent Interview,*

School Program Survey, *School Characteristic Survey*, and *Transcripts* from Waves 1 and 2, when participants were 13 to 19 and in school at the time data was collected.

Criterion Variables

Community participation outcomes were examined across three constructs to identify whether youth with disabilities are: (a) present in various community settings (i.e., community presence); (b) involved in community activities and presumed adult roles (i.e., community involvement); and (c) engaged in a network of personal relationships (i.e., social engagement). These three domains of community participation were based on a conceptual framework of O'Brien and O'Brien (1990) describing individuals' accomplishments of meaningful daytimes. These researchers' original framework described community participation across five areas (i.e., community presence, choice, community participation, respect, competence). However, the present study selected three areas (i.e., community presence, community participation, respect) given that the NLTS-2 dataset provide insufficient information across the five areas of community participation proposed by O'Brien and O'Brien. Three selected components were renamed based on characteristics of the dataset as: community presence, community involvement, and social engagement. Moreover, the competence component in their framework was regarded as a predictor variable in the present study. Therefore, it should be noted that the NLTS-2 dataset was not intended to provide a specific picture of community participation of youth with disabilities. The criterion variables were a composite of variables from multiple surveys associated with the NLTS-2. Data for the criterion variables selected from Wave 5 of the *Parent-Youth Interview*, with additional unique cases selected from Wave 4 only if data from Wave 5 were missing. In addition, the criterion variables represented combined responses from

youth and parent interview, because the youth interview resulted high rate of missing responses (more than 80%).

Community Presence. Community presence refers to being seen in ordinary community settings typically shared by others (O'Brien & O'Brien, 1990). The community presence construct was conceptualized with 10 items from the *Parent-Youth Interview* that asked if youth spent time in community settings when they were not working or going to school (see Table 2). The NLTS-2 items related to community presence were asked to both youth and parents. However, only 10 community settings were selected in this analysis: mall/café/coffee shop; outdoor physical activity settings; indoor physical activity settings; restaurant; bar/club; church; travel; camp/fishing/boating; health service facilities; and entertainment. Potential items originally identified in the dataset were excluded if: (a) items were unclear in describing if youth was present in community settings (e.g., how often youth has spent most of his/her time reading for pleasure/writing/studying on own/crosswords/going to library/listening to books on tape?), or (b) items revealed missing values greater than 80%. Therefore, a total of 10 items were included as indicators measuring community presence. Responses from the *Youth Interview* reveled high missing values (above 80%); therefore, this analysis used responses that contained youth responses if youth responded or parent responses if youth was not surveyed, thereby reducing the missing value to less than 22%.

Community Involvement. Community involvement refers to not only being a regular presence in community settings but also involved in community and adult activities (O'Brien & O'Brien, 1990). In addition, O'Brien expanded the definition as contributing to others by sharing one's capacities with others, such as having presumed adult roles (O'Brien & Blessing, 2011). The community involvement construct was conceptualized with 8 items from the *Parent-Youth*

Interview that asked whether youth were involved in the community activities, or exhibited adult roles (see Table 2). Involvement in the community was measured from two items asking if youth participated in community activities or volunteer/community services in the past 12 months. The items measuring having presumed adult roles used six items targeting voting, driving, having a saving/checking account, having a credit card, being employed, and being enrolled in postsecondary schools. All items were asked of both youth with disabilities and parents. Responses from the *Youth Interview* revealed high missing values (above 80%); therefore, this analysis used combined responses of both youth and parents if youth was not surveyed (missing value range 10–25%).

Social Engagement. Social engagement refers to being part of a network of personal relationships (O'Brien & O'Brien, 1990). The social engagement construct was conceptualized with three items from the *Parent-Youth Interview* related to social activities and friendship (see Table 2). Initially, seven items were considered as indicators of the social engagement construct; however, four items were excluded because of potential high missing values (e.g., how well youth gets along with co-workers/boss; how often youth hang out with friends in the past week; how much youth relied upon friends). Therefore, only three items was considered as indicators of social engagement. Two items provided information on engagement in the social activities or organized activities. The other item specifically provided information on friendships. Responses from the *Youth Interview* reveled high missing (above 80%); therefore, this analysis used combined responses from youth and parents, if youth was not surveyed (missing range 20–23%).

Predictor Variables

Given the limited research on community participation of youth with disabilities, variables was considered that have previously examined independent living outcomes of youth

with disabilities, including student demographics, student skills, and school program characteristics (Test, Mazzotti, et al., 2009). The literature mostly describes predictor variables that could potentially be associated with community participation outcomes of youth with significant disabilities (Bouck, 2010; Wehmeyer & Palmer, 2003). Predictor variables were examined across four categories: (a) youth-level including youth skills and abilities; (b) family-level including involvement, expectations, and support; (c) school-level including types of instructions and goals youth received in schools; and (d) community-level including types and accessibility to community. Data for predictor variables was selected from Waves 1 from multiple sources including: *School Program Survey, School Characteristics Survey, Parent-Youth Interview, and Transcripts.* A few questions were asked only in Wave 2 or in both Waves, but only for youth in particular conditions such as if the youth was in high school or had transition planning. For these questions, responses from Waves 1 and 2 were used as predictors. Table 3–6 described the list of predictor variables, along with response options from the NLTS-2 dataset.

Youth Domain. Youth-level variables was selected from the Wave 1 *Parent Interview* (PI) and *School Program Survey* (SPS), across eight areas: (a) functional skills including self-care and household responsibilities skills, (b) social skills, (c) communication skills, (d) role in transition planning, and (e) classroom behaviors (see Table 3). In the *Parent Interview*, parents provided information on youth's skills and abilities. Specifically, the functional skills was obtained from 4 items describing youth tasks related to cognitive skills (i.e., tell time, read common signs, count changes, and use the telephone). Information about self-care skills was measured from two items describing youth performance of daily living skills (i.e., dress and feed himself or herself). The household responsibilities skills were obtained from three items asking

of frequency youth completed household chores (i.e., fix meal, do laundry, and straighten up own room); all of these items were reverse coded 1 (never) to 4 (always) for consistency of responses.

Information on social skills were obtained from 8 items describing youth social interactions and behaviors (e.g., makes friends, handles disagreement, self-confident in social situations); some negatively worded items were reverse coded. In addition, communication skills were measured from five items (e.g., carry on a conversation, understand what people say); and reverse coded for consistency of responses.

This study also explored variables related to self-determination from the NLTS-2 *Direct Assessment* (i.e., 15 items on self-confidence; 13 items on autonomy; 5 items on self-realization; 6 items on empowerment). However, these items were excluded due to high rates of missing values (i.e., above 60%). This study included one item from the *School Program Survey* (SPS) that is related to self-determination, specifically describing the role of youth in transition planning. This item was asked only if there has been a transition planning for the youth. One-third of youth reported having transition planning from Wave 1, and a significant percentage reported from Wave 2. Therefore, this item used combined information from Waves 1 and 2.

Information on youth behaviors in classes was provided in the SPS. Due to the high missing values reported for student behaviors in general and vocational classes, only youth behaviors within the special education classes were included (e.g., stay on class work, follow direction). Negatively worded items were reverse coded.

Family Domain. Family-level variables were selected from the Wave 1 *Parent Interview* (PI), across the three areas: (a) parent involvement in education, (b) parent outcome expectations, and (c) family support (see Table 4). Based on the current research using the NLTS-2 dataset,

parental involvement was considered from both general and special education activities. Parent involvement in general education activities were measured from four items: frequency of attendance in general school meetings, school or class events, volunteers, and parent/teacher conference. Parent involvement in special education activities measured whether parents attended in the IEP meeting. In addition, the parent outcome expectations identified four items asked of parents the degree they expected their son/daughter to attend postsecondary school, get drivers license, live away from home without supervision, and get a paid job after they gradate high school. For the consistency of responses, these four items were reverse coded from 1 (definitely will) to 4 (definitely won't) into 1 (definitely won't) to 4 (definitely will). Finally, family support was measured with one item that asked the frequency with which parents spoke to their child about school experiences. The other items related to family support (e.g., how often they helped their child's homework) were excluded because more than half reported missing values.

School Domain. School-level variables were selected from the Wave 1 *Parent Interview* (PI), *School Program Survey* (SPS) and *Transcript*, across five areas: (a) inclusion, (b) access to the general curriculum, (c) accommodations/modification, (d) access to social networks, and (e) access to vocational programs (see Table 5). Information on general education experiences was selected from the *Transcript* data. The level of inclusion was measured by calculating the percent of time in academics in general education. Access to the general curriculum was obtained by determining whether youth had core academic subject courses (i.e., English, math, science). Information on accommodation/modifications to access general education curriculum included: accommodation/modification, additional assistance, and learning aids provided to youth.

Although a considerable number of the currently identified evidence-based practices focus on functional living skills (Test, Fowler, et al., 2009), the NLTS-2 does not provide sufficient variables targeting specific instruction of independent living skills while in school. However, the PI and SPS included information on social skill goals and activities. This study explored access to social networks from goals and activities provided during school (i.e., primary goal focused on social skill improvement, participation in the volunteer/community services and social activities out-of-class and school).

Likewise, access to vocational programs refers to primary goals related to job development, and classes taken for vocational experiences. Several job-related components have been identified as critical predictors of postschool employment of youth with disabilities (Test, Mazzotti, et al., 2009). As this study conceptualizes that community participation includes presumed adult roles, the variables related to vocational preparation during school needed to be considered. Two primary variables related to vocational skills were: extent of vocational involvement, and work experiences while youth was in secondary school. In addition, specific job-related classes youth took while in school was selected from the PI. These items were asked to youth who were in high school, thus, for this study, information from the Waves 1 and 2 were used.

Community Domain. Community-level variables was selected from the Wave 1 *School Characteristics Survey* and *Parent-Youth Interview*, across three aspects: (a) types of community, (b) accessibility to community, and (c) accessibility to transportation (see Table 6). The types of communities in which the school was located obtained from the SCS. Access to the community and use of transportation was selected from the PI, which specifically asked parents if youth got to places outside the home and used public transportation. For both items, if the

youth were not allowed to get to places or use transportation, NLTS-2 responses were recorded as "not applicable" and coded with a missing value codes. Thus, the responses to these two items were recoded from 1 (not at all) to 4 (very well) into 1 (not allowed) to 5 (very well). The item related to transportation was collected only in Wave 2.

Initially, this proposed study explored more variables associated with community characteristics, however, they were excluded for a variety of reasons. For example, five items related to availability of community services (i.e., public transportation, postsecondary schools, work facilities, independent living center, and support groups) were only asked of schools that served 12th grade students at the time when data was collected which was only one time. This resulted in a large portion of missing values for schools that did not serve 12th grade. Another item related to community safety (i.e., youth usually feels safe in his or her neighborhood) was only asked to youth with disabilities in Wave 2, which resulted in rates of missing values above 80%.

Covariate Variables

This study included covariate variables related to youth demographic characteristics: (a) gender (i.e., male, female), (b) race/ethnicity (i.e., White, Black, Hispanic), and (c) socioeconomic status (i.e., household of family income, range from $5,000 to $75,000). Data for covariates were selected from Wave 1.

Missing Data Analysis

Data missing is a common concern that cannot be ignored especially for longitudinal dataset. The most traditional way of dealing with missing data has been list-wise deletion method, which eliminates any cases with missing data from the analysis; however, this approach can result in biased parameters and standard errors (Enders, 2001). A pragmatic approach for

handling missing data is full information maximum likelihood (FIML) method. FIML is a model-based method of estimating parameters on the basis of available as well as missing data values given observed data (Olinsky, Chen, & Harlow, 2003; Schlomer, Bauman, & Card, 2010). FIML assumes that the data are at least missing at random (MAR), which means missingness is not related to unobserved data but related to some of the observed data.

Prior to the data analysis, missing data from attrition and non-responses was identified to select an appropriate method to reduce potential bias (Little & Rubin, 2002). This study utilized FIML to deal with missing values using Mplus 6.0 (Muthen & Muthen, 2003). Tables 7–11 show the number and percentage of missing values for each variable. All criterion variables revealed less than 25% missing data. All predictor variables held less than 50% missing data, with exceptions among some variables from the *School Program Survey* and *Transcript* (e.g., role in transition planning, classroom behaviors, inclusion in general education, classes related to vocational skills).

Data Analysis

Research Question 1 provided a descriptive picture of the level of community participation across three constructs: (a) community presence, (b) community involvement, and (c) social engagement. Cross tabulations using SPSS 18.0 were conducted to examine the patterns of characteristics of community participation for youth with significant disabilities. Descriptive statistics such as means, standard errors, and percentages were calculated. The NLTS-2 data analysis training materials report that students with low incidence disability categories were oversampled (i.e., students with significant disability); thus, a weighted sampling method is commonly recommended for secondary data analysis. However, the weighted sampling method was not used for this study. This is because the participants of this study were

selected by the severity of disability through systematic regression analysis, and not exclusively from the disability category, which is used for weighted sampling method.

Research Question 2 and 3 gauged the relationship between predictor constructs and community participation outcome constructs. A construct is a theoretical representation of the underlying trait, concept, or structure that the measurement/survey is designed to measure (Messick, 1989). To assess latent construct structures, the most commonly used method is factor analysis (FA). However, categorical variables that are binary or ordinal responses, factor analysis is not appropriate because linear associations of item responses are not clear; in addition, a continuous normal distribution cannot be established (Wirth & Edwards, 2007; Woods & Edwards, 2011). This results in serious biases that lead to attenuated Pearson correlations and underestimated factor loadings (DiStefano, 2002; West, Finch, & Curran, 1995).

Because most of the selected variables in this study were binary or ordinal responses, item response theory (IRT) was used as an alternative method to gauge the relationship between latent factors. Both FA and IRT use identical statistical formulations to evaluate the psychometric properties of a test, and thus both can be used to assess the underlying latent variable structure of a measurement. However, IRT overcomes the violations of the scale and distributional assumptions when categorical variables are used for a FA (Osteen, 2010).

Item response theory (IRT) model is "a framework for specifying mathematical functions that describe the interactions of persons and test items" (Reckase, 2009, p.v). IRT assumes that any probability of a given response of an individual to a set of categorically scored items involves the relationship between the person's ability and characteristics of the items (Bond & Fox, 2007; Johnson, 2007). An extension of IRT, multidimensional item response theory (MIRT) can serve for multiple-dimensionality of latent variables. Although the most common IRT model

assumes a single dimension (i.e., unidimension), MIRT assumes more than one dimension underlying responses to the items, and accounting for the differences between individuals (Reckase, 2009). A multidimensional assumption allows the estimation of each hypothesized unidimensional construct to be analyzed separately, while incorporating correlations between dimensions (Higginbotham, 2013).

Two subclasses of MIRT models can be identified depending on the characteristics of the item level: within-item multidimensional models and between-item multidimensional models (Adams, Wilson, & Wang, 1997). The within-item subclass refers to tests in which items are related to more than one latent dimension. The between-item subclass refers to tests in which items are being measured separate but related to latent dimensions, where each item is related to only one subscale, and the latent dimensions are assumed to correlate. Compared to the IRT model, the benefit of the MIRT is to provide greater clarity in understanding the dimensions, given the complexity of the data; thereby results in more reliable estimation of item and population parameters (Ackerman, Gierl, & Walker, 2003). In this sense, MIRT can serve for confirmatory or exploratory purposes of a measurement or survey (Marvelde, Glas, Landegehem, & Damme, 2006).

Prior to investigating the relationship between predictor and community participation outcome constructs, model fit was tested to confirm multidimensionality of latent constructs to address Research Question 2. A total of 96 items was considered from the multiple sources in the NLTS-2, and these were categorized into 17 constructs (i.e., dimensions) based on the theoretical background. Two steps were used to confirm the multidimensionality of latent constructs for this study. First, unidimensional analysis was conducted to investigate each of the construct's robustness using an item level parameter (i.e., factor loading). Completely standard factor

loading of .30 and above was used as a criterion to determine a strong factor loading and to establish a model (Brown, 2006; Kline, 2011). Since psychological longitudinal measures such as NLTS-2 were not intentionally designed for latent variable analysis, the factor loadings exceeding .30 can be used to confirm the model (Brown, 2006). In addition, statistical significance was tested at an alpha level of .01. In other words, the indicators were eliminated if they showed standard factor loadings below .30 or nonsignificant factor loadings ($p > .01$), thereby indicating that observed measures were not related to the latent construct. Each construct had one variance, one parameter for each item and one parameter for each estimated step. Population means was constrained to zero so that all item parameters can be estimated while ensuring parameter identification.

The second step was to test the multidimensionality of constructs and confirm the final model for the third analysis. To compare that competing models that were not nested in each other, the Akaike's information criterion (AIC) and Bayesian information criterion (BIC) parameters were used. The lowest AIC and BIC parameters among the models would indicate the best model fit (Allen & Wilson, 2006). For example, the three constructs in the community participation domain were considered all together to see which combinations of models showed the lowest AIC and BIC value. The same procedure occurred for the youth-level, family-level, school-level, and community-level predictors domains. With a confirmed model for each four domain, the overall model fit was tested.

Based on the confirmed model, the relationship between predictor constructs and community participation outcome constructs was examined to answer *Research Question 3*. The MIRT model allowed for a latent regression analysis to simultaneously estimate item parameters. The correlational relationships between the predictor constructs and community participation

outcome constructs were converted to predictive paths. Statistical significance was tested at an alpha level of .01. After establishing the prediction paths between constructs, covariates was added to the model to address Research Question 4 (i.e., gender, race/ethnicity, and socioeconomic status).

Marginal Maximum Likelihood (MML; Bock & Aitkin, 1981) was used to estimate the parameters of the MIRT models. MML estimation procedure is the most commonly used technique that assumes individuals who participated in the survey are independent each other and the item responses are independent (Johnson, 2007). MML estimation was implemented in Mplus 6.0 (Muthen & Muthen, 2003). Mplus software offers flexibility in the factor structure allowing binary and ordinal variables, and enables to statistically compare competing dimensional models. Mplus output produces population parameters for the multidimensional model, including factors means, variances, covariances, and correlations.

Summary

This study was based on the National Longitudinal Transition Study-2 (NLTS-2) dataset. A total of 470 youth with significant disabilities were identified from the NLTS-2 dataset through comprehensive multi-stage sampling analysis. This study used a logical sequences of analyses to examine adulthood outcomes for youth with significant disabilities related to community participation, and to investigate predictors associated with post-high school community participation outcome. Specifically, community participation outcome was investigated using descriptive analysis across three constructs: (a) community presence, (b) community involvement, and (c) social engagement. Then, multidimensional item response theory analysis was conducted to establish criterion and predictor constructs. Next, a latent regression analysis was conducted to measure the predictive paths between criterion constructs

and predictor constructs. Last, covariates were added to determine the degree of impact to the community participation of youth with significant disabilities.

Chapter 4. Results

The purpose of this study was to examine adulthood outcomes for youth with significant disabilities related to community participation, and to examine malleable factors (i.e., student, family, school, and community level factors) associated with improved community presence, community involvement, and social engagement. A logical sequence of analyses was conducted over four steps. First, frequency analysis of criterion variables (i.e., community participation outcome variables) was conducted. Second, a multidimensional item response theory analysis was used to establish the community participation outcome constructs (i.e., community presence, community involvement, and social engagement) and predictor constructs across four domains (i.e., youth, family, school, and community domain). Third, based on confirmed constructs, a latent regression analysis was conducted to measure the significance of the predictive relationship between predictor constructs and outcome constructs. Last, covariates (i.e., gender, race/ethnicity, and socioeconomic status) were considered to determine degree of impact on community participation.

Research Question 1: What are the characteristics of post-high school community participation of youth with significant disabilities as measured from the NLTS-2?

Research Question 1 examined the characteristics and patterns of post-high school community participation of youth with significant disabilities. Frequency analysis using cross tabulations were conducted in SPSS to identify patterns of disparate mean scores of community participation outcome variables for youth with significant disability group. Results are presented in three sections: community presence, community involvement, and social engagement. The values of percentages of participants with affirmative responses, mean, and standard deviation are presented.

Community presence. Presence in ordinary community settings among youth with significant disabilities was examined. Table 12 provides descriptive information about the ten variables that represented various community settings extracted from the NLTS-2 dataset. The result indicated that just over 20% of youth with significant disabilities spent time in outdoor physical activities such as playing sports, jogging, swimming, biking, and skating (M = .22, SD = .41). Almost 10% of youth responded to have been to mall/cafes/coffee shops, church, entertainment or events in the past week (M = .07, SD = .27; M = .09, SD = .29; M = .13, SD = .34, respectively). Few youth with significant disabilities, less than 5 % were present in community settings such as indoor gym, bars/clubs, outdoor activity places, and medical services (M = .03, SD = .17; M = .01, SD = .12; M = .01, SD = .07; M = .01, SD = .09, respectively). None of youth with significant disabilities were reported to have spent time eating in restaurants or outside home in the past week of the data collection. However, it is important to note that response rates of all variables were varied from 21% (N = 110) to 77% (N = 360). One-fourth of responses were missing except for two variables (CP01, CP04), because the items asked about time-limited information within the past week.

Community involvement. Involvement in community activities and presumed adult roles of youth with significant disabilities was investigated. The frequency analysis for the eight variables constructing community involvement is presented in Table 13. Half of youth with significant disabilities were reported to have participated in community activities over the past 12 months (M = .50, SD = .50). Almost one-third of youth had participated in volunteer community services over the past 12 months (M = .29, SD = .46). About 60% of youth with significant disabilities were reported to have a savings or checking account (M = .61, SD = .49), although few youth had a credit card (M = .12, SD = .33). Less than one-third of youth with

significant disabilities assumed to have adult roles such as being registered to vote and employed (M = .34, SD = .48; M = .38, SD = .49, respectively). Less than 10% of youth had a driving license or learners permit, or were enrolled in postsecondary education settings (M = .11, SD = .31; M = .05, SD = .22, respectively).

Social engagement. Engagement in a network of personal relationship of youth with significant disabilities was investigated. The frequency analysis for the three variables constructing social engagement is presented in Table 14. Half of the youth with significant disabilities were reported to had been invited to social activities with friends in the past 12 months (M = .51, SD = .50). Only 10% of youth responded that they spent time with friends in past week, whereas 65% of youth had hung out with friends more than 1 time a week for the last 12 months (M = .11, SD = .31; M = 1.49, SD = 1.48, respectively).

Research Question 2: Can community participation outcome constructs and predictor constructs be established?

Research Question 2 examined whether community participation outcome and predictor constructs could be established. Based on an initial 17 criterion and predictor constructs including 96 indicators, item response theory analysis was conducted to statistically establish the factors with a logical sequence of analyses: (a) unidimensional analysis of each construct, (b) multidimensional analysis of criterion construct and predictor constructs, and (c) finalized model.

Unidimensional item response analysis. To conduct unidimensional analyses, the item level parameters of each construct (i.e., factor loading) was investigated with a statistical significant at an alpha level of .01. Standard factor loading of .30 and above was used as the criterion for factor loadings significant enough to be included (Brown, 2006; Kline, 2011). In

this study, indicators exhibiting factor loadings below .30 and nonsignificant loadings ($p > .01$) were eliminated. As a result, a total of 13 criterion and predictor constructs were identified consisting of 58 indicators. Figure 5 reports criterion constructs resulting from this analysis. Figure 6 reports predictor constructs resulting from this analysis. In the next section, specific results are described.

Criterion variable: Community participation outcome. Based on the conceptual framework, three constructs were expected to be included in the community participation outcome domain: community presence, community involvement, and social engagement. All indicators of the three initial conceptual constructs met the criteria for possessing strong and statistically significant factor loadings. As shown in Table 15, 4 out of 10 indicators were positively related to the latent construct of community presence (CP). Standard factor loadings of four indicators were above .60, and loaded at a $p < .01$ level. Community places including mall/cafes/coffee shops, indoor gym, bars/clubs/party, and church were strong indicators of youth with significant disabilities' presence in the community. Specifically, the standard factor loading for one indicator CP03 (i.e., youth spent time in indoor physical activities such as exercising, working out, going to the gym) as estimated to be .80, which indicates 64% of the variance accounted for in the measured variable by the latent factor. However, it is important to note these indicators were asked in such a way as to reflect recent (within past week) presence of youth being in the community, and did not provide general or average patterns over time. Given the way NLTS-2 surveys were designed, specific information or patterns of common or regular participation in the community were not considered and could not be analyzed.

The latent construct of community involvement (CI) was tested and 5 out of 8 indicators positively related to this construct. Table 15 shows the five indicators that strongly loaded to the

latent construct, with factor loadings exceeding .38 at a $p < .01$ level. The indicators of youths' involvement in community or volunteer activities of being registered to vote, having savings or checking account, and being employed were strong indicators. Specifically, the standard factor loading of this indicator, CI08 (i.e., youth worked for pay during the last 2 years) is estimated to be .57, with 32% of the variance in the latent construct of CI is explained by this indicator.

With regard to the social engagement (SE) construct, the initial three indicators positively related to the latent construct, showing strong factor loadings above .58 (see Table 15, $p < .01$). The highest standard factor loading (i.e., SE03 youth usually gets together with friends) was estimated at .85, which indicates 72% of the variance accounted for in the measured variable by the latent construct of social engagement.

Predictor variable: Youth-level predictor domain. Based on the conceptual framework, five conceptual constructs—functional skills, social skills, communication skills, role in transition planning, classroom behaviors—were expected to be included in the youth-level predictor domain. Of the initial five constructs, four met the criteria of strong and statistically significant factor loadings; although one construct, role in transition planning, was eliminated because of limited variance explained from the single indicator included in this construct.

As shown in the Table 16, 8 out of 9 indicators were positively related to the latent construct of the functional skill (FSS) construct, and loaded statistically significant at a $p < .01$ level. All indicators showed strong factor loadings ranging from .48 to .85. Specifically, youth's skills related to telling time, reading common signs, counting change, looking up telephone numbers, dressing him/herself, fixing meals, doing laundry, and straightening up own room were strong indicators of the latent construct of functional skills of youth with significant disabilities. For example, standard factor loading of item FSS01 (how well youth tell time on a clock with

hands) was estimated at .88, which indicated 77% of the variance in the observed measure is accounted for in the latent factor of functional skills. The indicator SCS02 (how well youth feed him/her self completely) was excluded because of a high correlation with the other indicator HRS01 (how often youth fix his/her breakfast or lunch).

Likewise, the eight indicators used to define social behaviors were tested, and 4 out of 5 indicators positively related to the latent construct of social skill (SS). The four items (i.e., making friends, ending disagreement calmly, being self-confident in social situation, and avoiding troublesome situation) revealed to be strong indicators, with robust factor loadings ranging from .38 to .93 (see Table 16, $p < .01$). The highest standard factor loading was .93 for SS04 (being self-confident in social situations), indicating that 86% of the variance in the observed measure explained in the latent factor of social skills.

Three out of the initial six indicators positively loaded to communication skills (CS) latent construct, and with statistically significant factor loadings ranging from .43 to .98 (see Table 16, $p < .01$). Specifically, the characteristics of youth who speak clearly, carry on a conversation well, and understand what people say, were the strongest indicators representing the communication skills of youth with significant disabilities. The highest standard factor loading was .98 for CS03 (carry on conversation well), indicating that 96% of the variance in the observed measure is accounted for the latent factor of communication skills.

Six indicators under the classroom behaviors (CB) construct were tested, and four indicators loaded significantly to the latent construct of CB, showing a positive relationship (see Table 16, $p < .01$). The indicators were: staying focused on class work, withdrawing from social contact or class activities, performing up to his or her ability, and asking for what he/she needs in order to do his/her best. The standard factor loadings ranged from .60 to .88, with the highest

being CB03 (perform up to his or her ability), for which 77% of the variance was explained in the latent construct of classroom behaviors.

Predictor variable: Family-level predictors domain. Based on the conceptual framework, three constructs were expected to be included in the family-level predictors domain: family involvement in education, outcome expectation, and family support. Of the initial three constructs, two met the criteria for strong and statistically significant factor loadings (i.e., involvement in education, outcome expectation). Family support was eliminated because the single indicator had a negative impact to the variance explained for the latent construct. Table 17 summarizes the factor loadings.

Within the latent construct of family involvement in education (IE), all five indicators had positive and significant factor loadings ranging from .37 to .72 (see Table 17, $p < .01$). Family members' attendance in general school meetings, school or class events, volunteer activities, parent-teacher conferences, and IEP meetings appeared to be strong indicators of the family's involvement. Based on the standard factor loadings, family members' attendance in school or class event (IGE02) and volunteer activities (IGE03) explained half of the variance of the latent factor of family involvement in education.

The four indicators for parents' postschool outcome expectations were all positively related to the latent construct of outcome expectation (OE). Specifically, expectations for attending postsecondary education, getting a driver license, living independently, and getting a paid job were strong indicators with factor loadings exceeding .50 (see Table 17, $p < .01$). The highest standard factor loading was .95 for OE03 (expectation to the child to live away from home without supervision), indicating that 90% of the variance in the observed measure is accounted for the latent factor.

Predictor variable: School-level predictors domain. Five constructs were identified for inclusion in the school-level predictors domain: inclusion, access to general curriculum, accommodation/modifications, access to social networks, and access to vocational programs. Of the initial five conceptual constructs, three met the criteria (i.e., accommodation/modifications, access to social networks, access to vocational programs). The inclusion (IC) construct was excluded because it included a single continuous indicator that could not to be merged into other constructs which were categorical. The access to general curriculum (AGC) construct was excluded because of nonsignificant factor loadings for all indicators, which indicated observed measures were not related to the latent construct.

As shown in the Table 18, 9 out of the 11 indicators were positively related to the latent construct of accommodations/modifications (AMM), with robust factor loadings ranging from .57 to .90 ($p < .01$). More time or read the test to student, modified test or grading standards, slow-paced instruction, additional time to complete assignments or shorter the assignments, and frequent feedback, were identified as strong indicators to measure the accommodations/modification provided to the youth with significant disabilities from the NLTS-2 dataset. Standard factor loading of AMM07 (i.e., additional time to complete assignment) was estimated to be .90, which indicates 81% of the variance in the observed measure of having additional time to complete assignment is explained in the latent factor of accommodations/modifications.

The latent construct of access to a social network (ASN) was tested using indicators that described if youth had participated in community activities or volunteer/community services inside or outside of school, positively and significantly related to the latent construct of ASN (see Table 18, $p < .01$). All factor loadings for the three indicators had strong relationships with

loadings ranging from .48 to .71. The indicator of participation in community activities (ASN02) explained half of the variance of the latent construct.

For the access to vocational program (AVP) construct, among the initial 14 indicators, five indicators were positively related to the latent construct with statistically significant factor loadings above .60 (see Table 18, $p < .01$). Specifically, indicators relevant to the vocational and employment experiences and supports youth had during high school (e.g., career assessment, job search instruction, job showing and work exploration, specific job skills training, and job coach) strongly represented the access to vocational program of youth with significant disabilities. The highest standard factor loading of AVP07 (job shadowing and work exploration class) was estimated at .83, indicating 69% of the variance is explained in the latent factor of AVP.

Predictor variable: Community-level predictors domain. Initially, three constructs (i.e., type of community, accessibility to community, and accessibility to transportation) were expected to represent a community-level predictors domain. Reconceptualization of these constructs was conducted due to the limited items available within NLTS-2 database representing this domain. Therefore, three indicators were tested to determine whether they could represent a community factor (CF) construct. As shown in Table 19, two indicators were positively related, showing strong statistically significant factor loadings exceeding .60 ($p < .01$). Accessibility to the places in the community and to public transportation were the strongest indicators of a latent construct for community factors.

Multidimensional item response analysis. Based on the previously confirmed 13 latent constructs, a multidimensional item response theory analysis was conducted to investigate the best model for each domain: community participation outcomes, youth-level predictors, family-level predictors, school-level predictors, and community-level predictors. To test the model fit of

multidimensionality of constructs, the lowest AIC and BIC values were used as criterion for the decision to select the best model in the four domains (Allen & Wilson, 2006). The results confirmed a total of nine constructs, specifically: two constructs in the community participation outcomes domain, two constructs in youth-level predictors, two constructs in the family-level predictors, two constructs in the school-level predictors, and one construct in the community-level predictors. Table 20-24 reports the best and near best models resulting from this analyses.

Criterion variable: Community participation outcome. Unidimentional item response theory analysis for criterion variable confirmed the three latent constructs: community presence, community involvement, and social engagement. Four combinations of models were tested. The combinations of constructs that included the CP construct showed low AIC and BIC parameters (see Model 3 in Table 20), with the CP construct revealed to be negatively related to the CI construct (r = -0.136). This was antithetical to the theoretical understanding for community participation, and one of possible reasons could be that all indicators were extremely skewed which may lead variance prohibiting accurate explanation of the latent construct. For this reason, the CP construct was eliminated from the model. As a result, the combination of two constructs—community involvement (CI) and social engagement (SE)—was selected (AIC = 4317.513, BIC = 4403.431; see Model 4 in Table 20). Each of the two constructs was robust, showing strong factor loadings and good model fit. The latent constructs of community involvement and social engagement are reliably estimated from the NLTS-2 dataset specifically targeting community participation outcome domains for youth with significant disabilities.

Predictor variable: Youth-level predictor domain. Based on the unidimentional item response theory analysis, four latent constructs were tested to determine the best model for the youth-level predictors domain: functional skills, social skills, communication skills, and

classroom behaviors. The analysis of nine combinations of the model was conducted using the AIC and BIC parameters. Given the emphasis of youth's functional skills as a critical predictor of postschool success throughout the current theoretical and empirical literature (Carter et al., 2012; Rojewski et al., 2013; Shattuck et al., 2011; Shogren et al., 2014), it was deemed necessary to include the functional skills construct in the model as a priority; although the combination of communication skills and classroom behaviors constructs revealed the lowest AIC and BIC (see Model 4 in Table 21). Thus, among the model combinations including the FSS construct, the combination of FSS (functional skills) and CB (classroom behaviors) showed the lowest AIC and BIC parameters (AIC = 10184.984, BIC = 10371.665; see Model 8 in Table 21). Each of the constructs was robust, with strong factor loadings and good model fit. These constructs are reliably estimated from the NLTS-2 dataset specifically targeting youth-level predictors domain for youth with significant disabilities.

Predictor variable: Family-level predictor domain. The best model for the family-level predictors domain was investigated based on the result of unidimensional item response analysis. A total of two latent constructs (i.e., involvement in education and outcome expectation) were tested for the multidimensionality. As a result, the combination of the two constructs—involvement in education (IE) and outcome expectation (OE)—showed low AIC and BIC parameters (see Model 1 in Table 22, AIC = 6988.874, BIC = 7129.922). Each of the two constructs proved to be robust, presenting strong factor loadings and good model fit. This indicates that these constructs can be reliably estimated from the NLTS-2 dataset specifically focusing on family-level predictors domain for youth with significant disabilities.

Predictor variable: School-level predictor domain. To determine the best model for the three latent constructs representing school-level predictor domains (i.e.,

accommodations/modifications, access to the social networks, and access to the vocational programs), four combinations of models were tested based on the AIC and BIC parameters. As a result, a two-construct model—access to the social networks (ASN) and access to the vocational programs (AVP)—resulted in the lowest AIC and BIC parameters indicating good model fit (AIC = 3636.854, BIC = 3707.414; see Model 4 in Table 23). Each of the two constructs proved to be robust, presenting strong factor loadings and good model fit. This indicates that these constructs can be reliably estimated from the NLTS-2 dataset specifically focusing on school-level predictors domain for youth with significant disabilities.

Predictor variable: Community-level predictor domain. Further analysis for multidimensionality was not conducted because a single construct presented in the community-level domain. The CF construct was robust, presenting strong factor loadings and good model fit (see Model 1 in Table 24, AIC = 1661.997, BIC = 1694.799). This construct can be reliably estimated from the NLTS-2 dataset specifically targeting community-level predictors domain for youth with significant disabilities.

Final model. Multidimensional item response theory analyses confirmed the nine latent constructs across four domains. Next, the overall model was established. To determine the best model, several combinations of latent constructs were examined using the AIC and BIC parameters (Allen & Wilson, 2006). It is important to note that the baseline of all combinations included both CI and SE constructs because they are the criterion variables, which are critical outcome constructs in investigating predictive relationships. Based on the two criterion constructs, the seven predictor constructs were added step by step (Grimm & Yarnold, 1995). The purpose of this step is to include as many predictor constructs in the finalized model in order to examine the predictive relationships among latent constructs with sufficient number of

constructs. A total of 255 models were generated that represent all possible combinations of constructs, and tested as below.

First, the combinations of four constructs were investigated. However, only seven models were successfully conducted, and the results are presented in Table 25 (see Models 1 to 7). The combination of CI, SE, ASN, AVP showed the lowest AIC and BIC parameters (AIC = 7927.656, BIC = 8101.982; see Model 7). To examine whether a combination of five constructs could be established, the same analytic procedure was undertaken. Only three models were successfully completed (see Models 8 to 10). The result showed that the combination of CI, SE, OE, AVP, IE revealed the lowest AIC and BIC parameters (AIC = 13964.707, BIC = 14284.293; see Model 10). Next, the combinations of six constructs were investigated. This process resulted one model established with CI, SE, FSS, ASN, CB, AVP constructs (AIC = 18517.934, BIC = 18928.843; see Model 11). Further step by step adding approach was not successfully conducted.

Therefore, final model included the empirically verified six constructs—community involvement, social engagement, functional skills, classroom behaviors, access to the social network, and access to the vocational programs—showing good model fit (AIC = 18517.934, BIC = 18928.843; see Model 11 in Table 25). The parameters of final model are described in the Table 27. The specific description each of confirmed constructs, data sources and indicators, and modifications from conceptual framework are described in the Table 26.

Research Question 3: To what extent do youth, family, school, and community constructs predict the post-high school community participation of youth with significant disabilities?

Based on the final confirmed model, Research Question 3 asked to what extent the youth and school-levels latent constructs predict the post-high school community involvement (CI) and social engagement (SE) of youth with significant disabilities. Youth-level latent constructs

included functional skills (FSS) and classroom behaviors (CB). School-level latent constructs included access to the social network (ASN) and access to the vocational programs (AVP).

As shown in the Table 28, two predictor constructs were positive and strong predictors of community involvement criterion construct, and one predictor construct was a positive and strong predictor of social engagement criterion construct. The results of this study found that 83% of the variance in the community involvement constructs is explained by the two predictors, youth's functional skills and access to social network. Specifically, the functional skills of youth had a significant effect on community involvement outcome (b = 0.872, B = 0.354, $p < .01$), which indicating that youth who revealed higher functional performances are more likely to be involved in community activities including presumed adult roles. Access to social network showed a significant effect on community involvement outcome (b = 1.299, B = 0.528, $p < .01$). This indicates that as youth had more opportunities to access to social networks while in school, post-high school community involvement increased.

The results of this study also found that 23% of the variance from the social engagement constructs is explained with one predictor, access to social network. Access to social network showed a significant effect on social engagement outcome (b = 0.494, B = 0.431, $p < .01$). This indicates that as youth had more opportunities to access to social network while in school, their post-high school social engagement increased. The predictive paths are described in the Figure 8.

Research Question 4: To what degree do key covariates influence community participation of youth with significant disabilities?

Based on the previous predictive paths, Research Question 4 asked to what degree the key covariates (i.e., gender, race/ethnicity, and socioeconomic status) influence to post-high school community involvement and social engagement of youth with significant disabilities.

However, the model including the three covariates to address the last research question could not be normally conducted. Along with the analytic processes that were conducted to answer this research question, possible reasons of analytic errors are described.

A consistent error message was shown in the outputs when the model including covariates was tested: the estimated covariance matrix could not be inverted due to an error in the computation. This indicated that the computation of analytic procedure could not be completed, therefore it stopped in the middle of iteration. To solve this analytic problem, changing the model and/or testing with starting values was suggested. The first step was taken to change the original model that included three covariates at once to control for all demographics, so that model could be tested with lesser covariance (the original model command: CI ON FSS CB ASN AVP gender race socioeconomic status, and SE ON FSS CB ASN AVP gender race socioeconomic status). Specifically, the model was tested separately by adding one covariate at a time. For example, only gender covariate variable was added to the model (1st trial model command: CI ON FSS CB ASN AVP gender, and SE ON FSS CB ASN AVP gender; 2nd trial model command: CI ON FSS CB ASN AVP race, and SE ON FSS CB ASN AVP race; 3rd trial model command: CI ON FSS CB ASN AVP socioeconomic status, and SE ON FSS CB ASN AVP socioeconomic status). Additionally, the model was tested separately by including one criterion construct at a time with one covariate (generated six combination models; e.g., CI ON FSS CB ASN AVP gender). However, the revised models could not be terminated normally and received the same error message. Since the model without adding covariates worked successfully (see Research Question 3), no analytical misconduct could be found in this process.

Given that reducing covariance among demographic variables was not helpful to test the model normally, a next step was taken to treat all the categorical variables as continuous

variables. When treating categorical variables as continuous, the parameters became biased such as factor loadings are underestimated and Type I error are increased (Johnson & Creech, 1983). However, the estimated parameters of latent structure (i.e., factor correlations and regression coefficients) would be unbiased with a large enough sample size (Rhemtulla, Brosseau-Liard, & Savalei, 2012). According to these authors, the sample size in the present study was large enough to prevent biased results. Thus, to address Research Question 4, all the variables were treated as continuous in the model. However, the model was not normally conducted and received the same error message.

Overall, the result of Research Question 4 could not be described even though several problem-solving processes were conducted. There are possible reasons of analytic failure. The variables used from the NLTS-2 dataset did not provide enough variability to conduct the analysis due to the number of categories is small (i.e., binary responses). Therefore, biased parameters estimated might impact to the failure of analysis. Furthermore, few researchers investigated the impact of covariates (i.e., demographic variables of youth) on adulthood outcomes. Among them, different sample and different analytic methods (e.g., logistic regression) have been conducted, but not utilized latent structure analysis.

Summary

Post-high school community participation outcome of youth with significant disabilities was examined using a logical sequence of analyses. First, descriptive information of community participation was addressed in three aspects. Youth with significant disabilities rarely participated in 10 community places: mall/café/coffee shop; outdoor physical activity settings; indoor physical activity settings; restaurant; bar/club; church; travel; camp/fishing/boating; health service facilities; and entertainment. Half of young adults participated in community

activities or volunteer services. However, few of them reported to have established adult roles including paid employment, being registered to vote, and enrolled in postsecondary education. Youth with significant disabilities revealed their social engagement mostly with friends with more than half participating in social activities, getting invitations, or hanging out.

Second, criterion and predictor constructs were established using a multidimensional item response theory analysis. The item parameters of each construct was considered based on factor loadings of .30 and above at an alpha level of .01. Among the theoretically identified 17 constructs, 13 criterion and predictor constructs were identified with strong and positive factor loadings ($p < .01$). Thus, multidimensionality of 13 constructs was tested based on lowest AIC and BIC estimates. This results confirmed a total of nine constructs, specifically: two constructs in the community participation criterion domain (i.e., community presence, social engagement), two constructs in the youth-level predictors (i.e., functional skills, classroom behaviors), two constructs in the family-level predictors (i.e., involvement in education, outcome expectation), two constructs in the school-level predictors (i.e., access to social networks, access to vocational programs), and one construct in the community-level predictor (i.e., community factor). Based on the confirmed nine constructs, the overall model was determined by testing several combinations of latent constructs based on AIC and BIC values. As a result, the final model showed good model fit with empirically verified six constructs: community involvement, social engagement, functional skills, classroom behaviors, access to the social networks, and access to the vocational programs (AIC = 18517.934, BIC = 18928.843).

Third, based on the final model including six latent constructs, a latent regression analysis was conducted to investigate the significance of the predictive relationship between criterion and predictor constructs. Results showed that access to the social networks is strong and

positive predictor of both post-school community involvement and social engagement outcome of youth with significant disabilities (b = 1.299, B = 0.528, $p < .01$; b = 0.494, B = 0.431, $p < .01$, respectively). Additionally, functional skills of youth was identified as a predictor of post-school community involvement (b = 0.872, B = 0.354, $p < .01$).

Last, three covariates were considered to the predictive paths to determine degree of impact on community participation. However, this research question could not be normally conducted although several problem-solving processes were tried.

Chapter 5 Discussion

The successful movement from school to adult roles has been challenging for youth with significant disabilities. They are more likely to experience limited access to community resources, insufficient economic self-sufficiency, and restricted social relationships. Using data from the National Longitudinal Transition Study-2 (NLTS-2), this study examined key characteristics of post-high school community participation across three areas: community presence, community involvement, and social engagement. Item response theory analysis determined the predictive relationships of youth, family, school, and community variables on community participation. Key findings from the results are summarized, focusing three areas: (a) description of community participation outcomes for youth with significant disabilities; (b) the role that access to social networks played on community participation; and (c) the role that youth's characteristics influenced outcomes. Along with key findings, the limitations of the study and implications for future research and practice are discussed.

Key Findings

Community participation of youth with significant disabilities. In this study, results from the descriptive analyses of community participation were reported. Aspects of community participation were investigated by measuring frequencies of access to community resources as well as types of community experiences, activities, and social networks. Based on the "Framework for Accomplishment" (O'Brien & O'Brien, 1990), the post-high school community participation of youth with significant disabilities was investigated focusing on: community presence, community involvement, and social engagement.

Community presence. In terms of community presence, youth with significant disabilities rarely participated in community locations. Frequency results showed that few youth were

reported to visit mall/café/coffee shops, indoor physical activity settings such as gyms, bars/clubs, churches, health centers, or other venues. Surprisingly, none were reported to go to restaurants for meals. Given that few studies have reported on the community life of young adults with significant disabilities, the findings provide some of the most current data related to community presence. The poor outcomes are consistent with current research that has identified a shortage of access and opportunities to community resources for individuals with disabilities (McCarron et al., 2011; Radermacher et al., 2010; Rogan & Walker, 2007). Presence within the community is often regarded as a precondition of higher levels of involvement and more developed social networks. Additionally, a discontinuity between school engagement and community life has been observed among youth with disabilities during the early stages of adulthood. Given current concerns that individuals with disabilities lose social contacts and become disengaged from their networks as they age (Clement & Bigby, 2009; Levasseur et al., 2010), the outcomes observed in this study provide an indication that social isolation may get worse as young adults exit school.

Meanwhile, the highest rated community location was related to outdoor physical activities including jogging, swimming, biking, and skating. Leisure activities have been noted as a common approach to social engagement for individuals with disabilities (Abells, Burbidge, & Minnes, 2008; Badia et al., 2011; Bray & Gates, 2003; Zijlstra & Vlaskamp, 2005). In addition, the International Classification of Functioning, Disability, and Health (ICF) of World Health Organization (WHO, 2001) defined leisure activities as a major area of social integration. This study confirmed that youth with significant disabilities were most likely to be engaged in outdoor leisure activities as compared to any other community setting. However, the findings should be interpreted with caution given the characteristics inherent in the NLTS-2 survey items.

Specifically, the items related to the community presence construct asked time-limited information (e.g., how youth has spent most of his/her time when not working or going to school in last week), therefore the results may provide a truncated pattern of community presence.

Community involvement. Results showed that more than half of the youth with significant disabilities participated in community activities or volunteer services. Few of the youth were reported to have established adult roles, such as paid employment or being registered to vote. Two-thirds of the youth had a savings or checking account. Community involvement can be viewed as both an objective and subjective outcome (Piskur et al., 2014). When subjective, it is important to consider the individual's proximity to others (Balandin, 2011; Bigby & Wiesel, 2011). This study focused on the more objective meaning of community involvement, by examining specific types of adult activities and adult roles. In this sense, this finding should be cautiously interpreted.

Some researchers have suggested future investigations include both qualitative and quantitative analysis of community involvement. Levasser and colleagues (2010) suggested a taxonomy of social involvement describing six levels on a continuum from passive to active. Passive social involvement addressing Levels 1 and 2 refer to having a presence in community activities but without interactions with others. Active social involvement (Levels 3 to 6) refer to engaging in community activities that include helping others and contributing to society. The importance of an active level of social involvement is one way to gain a stronger sense of community belonging (Milner & Kelly, 2009). Previous analysis of NLTS-2 reported that youth were more likely to participate in volunteer or community services if they had earned a postsecondary degree or license/certificate (Newman et al., 2010; Newman et al., 2011; Wagner et al., 2005). However, few youth with significant disabilities were enrolled in postsecondary

education settings. Possible links between lower levels of community involvement and enrollment in postsecondary education may be present, but it is not a clear causal relationship. Further research is needed to isolate predictions of community involvement while controlling for such characteristics and severity of disability.

Social engagement. Distinguishing community involvement and social engagement is difficult because activities in social contexts typically take place through interactions with others. The concept of community participation has been used interchangeably with social engagement. This study also found community involvement and social engagement constructs were highly correlated. This lent credence to the issue of community activities and personal interactions being intertwined. Likewise, Levasseur and colleagues (2010) defined community participation as a "person's involvement in activities that provide interactions with others in society or the community" (p. 666). In the current study, youth with significant disabilities were engaged in social interactions mostly with friends with more than half participating in social activities, getting invitations, or hanging out. However, this study could not differentiate the quality of social interaction among students with significant disabilities given the limited range of variables available. It is important to note that research has indicated that individuals with significant disabilities experience difficulties in building and maintaining social interactions due to lack of reciprocity required to maintain friendships (Kennedy et al., 1989; Kobayashi & Murata, 1998; Howlin, 2000), and future research is needed in this area.

Access to social networks. Results from this study confirmed that access to a social network is a predictor of both post-school community involvement and social engagement. Specifically, as youth gained access to a larger social network through school activities, volunteering or community services while in school, they were more likely to continue to be

engaged postschool in a variety community activities (i.e., volunteer, community services), and were more likely to engage in adult roles (i.e., voting, financial activity, employment). Additionally, their level of access to a social network while in high school impacted higher levels of social engagement with friends postschool. Given the lack of research investigating predictive relationships of school-level factors on community participation outcomes, these findings broaden the evidence that social network exposure and experiences in high school impact community involvement and social engagement outcomes.

These findings suggest the importance of exposure to social networks while youth are in high schools. Social networks can provide opportunities to engage in social activities, volunteering, and community services as well as to get to know people and maintain relationship with others (White, Simpson, Gonda, Ravesloot, & Coble, 2010). In the literature, this is introduced as developing social capital (Trainor, Carter, Swedeen, & Pickett, 2012; Trainor, Morningstar, Murray, & Kim, 2013). Social capital is comprised of networks among people either formal or informal, which provides access to information and resources either directly or indirectly (Trainor, 2008). For example, young adult who volunteers at the Humane Society may learn basic knowledge of tips for socializing with pets or nursing rescued pets, as well as increased awareness of interpersonal skills (e.g., how to communicate with staff, how to handle conflict situation) and economic resources (e.g., fees or tools necessary to raise a pet, news of job openings related to taking care of pets). Social capital and networking is essential to community engagement and is commonly found in typical adult lives. Recently, strengthening social capital has been emphasized to improve post-high school community engagement of youth with disabilities (Trainor et al., 2013). Receiving sufficient instructional opportunities to engage in social activities, volunteering, and community services while in school positively impacts

engagement in community activities and social interactions. In addition, social networks can promote youth to assume valued community roles.

When examining social network opportunities, it is important to consider the possibility of social isolation when students are away from the general education classroom (Carter et al., 2009; Trainor, Carter, Owens, & Swedeen, 2008). School segregation limits involvement in core curricular classes, restricts general education participation, and prohibits friendships that may occur naturally. Inclusion in general education has been emphasized throughout the literature. In fact, studies have strongly affirmed that youth with developmental disabilities who were educated in general curriculum tended to participation more often in social leisure activities (Badia et al., 2011; Imms, Reilly, Carlin, & Dodd, 2009; Orlin et al., 2010). Inclusive education was found to have a positive effect on successful postschool outcomes of youth (Baer et al., 2003; Halpern et al., 1995; White & Weiner, 2004). The findings of this study regarding community-based social network activities that took students out of school should be viewed with caution. Community-based social network experiences delivered during the school day may impede the youths' involvement in general education and natural socialization opportunities with their peers.

Functional skills. Result from this study confirmed that the functional skill level of youth was a key predictor of postschool community involvement, but not social engagement. The performance level of a set of functional skills was positively related to community involvement in certain adult roles. Youth-level factors, such as the acquisition of daily living, self-care, self-determination, and social skills have predicted postschool outcomes and quality of life (Test, Fowler, et al., 2009; Wehmeyer & Field, 2007). The findings from this study support the relationship between functional skills of youth and post-school community involvement,

which has not been investigated previously. Furthermore, this finding expands the discoveries from current studies that daily living and self-care skills are predictors of independent living.

It is important to note that functional skills in this study included self-care and household skills as well as functional cognitive skills. Examples of self-care skills targeted in this study included dressing and feeding without help. Examples of household responsibility skills included fixing meals, doing laundry, and straightening up room. Previously, functional cognitive skills were identified as a predictor of successful postschool employment (Carter et al., 2012; Rojewski et al., 2013). However, self-care and household responsibilities skills have not been used in the past. Past research focused on only measures of functional cognitive skills using four items within the NLTS-2 dataset (e.g., telling time on a clock, reading and understanding common signs, counting change, looking up telephone numbers in a phonebook and using the telephone), which offered a narrow view of what constitutes functional skills. This study, however, identified functional cognitive skills, self-care skills, and household responsibility skills as additional variables representing the functional performance of youth. This study provided a broader representation of what is included in functional skills, along with positive correlations to post-high school community life.

Limitations

The implications of the present study should be interpreted with some caution, given several limitations. First, the findings of this study were based on self- and parent-report measures. The disadvantage of self-report measures are associated with the potential validity of the responses, because of the reliance on the honesty of respondents (Fowler, 1995). Respondents' cognitive biases or recall dysfunction may provide inaccurate information. Furthermore, it is important to also note that most of variables used in this present study reflected

parents' perspectives and only to lesser extent, youth. Given that the NLTS-2 *Youth Interview* reported high rate of missing responses, most of variables were selected from the *Parent Interview*. Therefore, limited or biased perceptions toward community life of youth with significant disabilities may be attributed to some responses. However, this is a common limitation reported from research associated with individuals with significant disabilities. Given limited communication skills, perceptions are often interpreted by family members or primary caregivers (Clement & Bigby, 2009). For future research, balanced perceptions of both youth and parents should be gathered to investigate the lives of individuals with significant disabilities.

Second, the sample size of this study should be considered. Because this study selected the sample by the severity of disability through systematic regression analysis and not exclusively from the disability category, sampling weights were not used. Thus, this study can inform the field about the association between predictor variables and community participation outcomes, but cannot generalize the predictive path to the full population of students with significant disabilities. Furthermore, this study only considered White, African-American, and Hispanic youth, thereby providing possible biased picture of community life among certain subgroups of youth with significant disabilities. Additional research is needed to examine the role of functional skills and social network experiences on community life among Asian and Native American youth with significant disabilities. In addition, future research is needed to examine the role of different ethnicity play with regard to post-high school community life of youth with significant disabilities.

Third, the selection of variables lead to research limitations. The variables selected to examine community participation were limited because the NLTS-2 survey itself did not sufficiently obtain substantive information specifically relevant to the questions. In fact,

variables related to community presence, community involvement, and social engagement were most often asked as time-limited. For example, questions related to community presence asked, "what the youth did in his/her free time within the last week?" Wording of items may have caused high rates of missing and skewed responses. Specifically, the original construct of community presence (e.g., going out eat, leisure activities) were negatively correlated with the community involvement construct, which was antithetical to the broader theoretical framework of community participation. One possible reason could be that the indicators were extremely skewed toward not being present in the community. In fact, given that the responses were predominantly negative, there was very little variability among indicators in this construct. The results of this study may provide a truncated pattern of community participation of youth with significant disabilities, and should be interpreted with caution.

Furthermore, some predictor variables—inclusion in general education, work experiences, student support, self-determination, communication skills—that have been recognized as important contributors to successful postschool outcomes were excluded in this study due to high levels of missing data that would biased results. This study provided no support for the hypothesis that family and community-level factors predicted community participation. The magnitude of correlations between the family and community-level variables and the criterion variables were relatively small; and none of the variables were statistically significant in the models. This findings conflicts with the theoretical and empirical evidence that have supported the importance of parental involvement and parental expectations predicting postschool outcomes (Doren et al., 2012; Lindstrom et al., 2007; Morningstar et al., 2010; Newman, 2005). Given the significance of family-level factors in supporting successful

postschool outcomes, this limitation should be interpreted with caution and future research is needed.

Implications for Future Research and Practice

This study has important implications for future research and practice. First, identifying a descriptive representation of community participation is critical to the field. This is the most significant discovery given that there is a paucity of research describing community participation in the lives of individuals with significant disabilities. Considering that access to community resources is a common value of community participation, as well as a precondition to meaningful social engagement (Balandin, 2011; Bigby & Wiesel, 2011; O'Brien & O'Brien, 1990), this study's negative results pertaining to community presence is somewhat disappointing. Given that community participation is a process by which various adulthood goals can be achieved (Myers et al., 1998), a lack of community presence and involvement increases the urgency to continue to understand community lives of youth with significant disabilities. Recognizing individuals with significant disabilities as citizens of one's community should be a primary focus for understanding and supporting them as members. The importance of citizenship and community participation should be aligned to school curricula to make a successful transition from school to community. Furthermore, future research is needed to determine strategies for action and interventions promoting social integration. It is worthwhile to note the common characteristics of socially integrated individuals with disabilities are: (a) being accepted as an individual and a member of community; (b) being involved in activities and contributing to society; (c) being respected and having reciprocal personal relationships; (d) sharing ordinary places and activities; and (e) receiving formal and informal supports (Hall, 2009; Martin, 2006; McPhedran, 2011; O'Brien & Blessing, 2011; Raymond, Grenier, & Hanley, 2014). Milner and Kelly (2009)

addressed other attributing factors impacting a sense of belonging: contributions to society, having higher expectations, reciprocal relationships, and having a valued social identity.

Importantly, presenting a descriptive picture of community participation leads credence to future research with respect to the multi-dimensionality of community participation. In the literature, none of studies currently examining the National Longitudinal Transition Study-2 database have investigated community life. Especially for youth with significant disabilities, most studies have focused on adulthood outcomes in the areas of employment; thereby viewing adulthood lives as simplified and dichotomous (Bouck, 2012; Brown et al., 2009; Carter et al., 2012). Simultaneously, most evidence-based practices have been limited to skill development relevant to employment and postsecondary education learning (Test, Mazzotti, et al., 2009). By focusing on community lives of youth with significant disabilities, this study offers a broadened adulthood outcomes. This is a consistent effort with current research by Morningstar and Trainor (2013) that addressed diverse domains of adult life engagement and included community participation and independent living as aspects of adulthood outcomes. By including youth with significant disabilities population in this study, multi-dimensional views of successful adult outcomes would support future transition practices and policies to promise ongoing support for this group. Expanding the meaning of adulthood would lift societal expectations toward youth with significant disabilities, which was identified as one of barriers that prohibited social integration.

Second, this study only measured quantitative variables of community participation. Several researchers have argued the importance of qualitative aspects of community participation in such areas as level of involvement in social activities/network, or life satisfaction (Amado, Stancliffe, McCarron, & McCallion, 2013; Crapps, Langone, & Swaim, 1985; Pretty, Rapely, &

Bramston, 2002). Wheeler and colleagues (2007)'s reported that community participation should be measured using both quantitative and qualitative measures since these authors found no correlations between the frequency of community activities and levels of satisfaction. Concurrently, researchers have mentioned difficulties of measuring qualitative aspects of community life because of confounding complex and individualized personal factors. For example, Honneth (1995) described that social recognition from others was an important dimension of community participation, but they found it depended on the extent to which individual felt they were accepted by others and involved in social activities and personal networks. Future research is need to examine multiple aspects of community participation of youth with significant disabilities, using both methods of data collection and analysis. Given the limitations addressed related to the NLTS-2 survey items, currently used measurements from other studies can provide direction for future research to comprehensively investigate the community lives of youth with significant disabilities (e.g., Community Integration Questionnaire, Community Facilities Checklist, Neighborhood Youth Inventory; Loreau et al., 2004; Washington, Wilson, Engel, & Jensen, 2007).

Third, this study identified predictors that increase community participation of youth with significant disabilities. This expands current investigations that identify the predictors of postschool success of youth with disabilities mostly in the areas of employment and postsecondary education. Specifically, youths' functional skills were identified as factor for promoting post-high school community involvement. Although functional cognitive skills has been identified as a common predictor of successful postschool outcomes of youth with disabilities in previous studies (Carter et al., 2012; Rojewski et al., 2013; Shattuck et al., 2011; Shogren et al., 2014), this study suggests broadening conceptualization of functional skills by

including self-care and household responsibilities skills as well as functional cognitive skills. Practitioners should be familiar with current evidence-based practices, such as community-based instruction, backward chaining, forward chaining, progressive time delay, self-monitoring instruction, simultaneous prompting, and total task chaining, that have been shown to be effective with students with disabilities (Test, Fowler, et al., 2009).

Fourth, this study offers additional support for accessing a social network while in school as a method for promoting post-high school community involvement and social engagement. This is a new finding because access to school social networks has not been explored as a predictor of any postschool outcome domains, although the effect of community experiences has been identified as predicting employment outcomes (White & Weiner, 2004). Given the robust relationship between access to a social network and the community participation outcome, practitioners should work to make sure youth with significant disabilities receive sufficient opportunities to be engaged in volunteer and community service projects, and build social relationships with friends while in school. It is important to note that social networks should be developed by balancing quality inclusive educational experiences. Unfortunately, effective and efficient ways of increasing social networks opportunities only emerging; and future research is needed. Practitioners can familiarize with social skills instructions--response prompting, self-management instruction, and simulations--that have been shown to be effective with students with disabilities (Test, Fowler, et al., 2009).

Last, this study provides not clear support why some predictors that have been identified to be effective with regard to independent living outcomes (i.e., inclusion in general education, work experiences, and student support) (Blackorby, Hancock, & Siegel, 1993; Bullis et al., 1995; Heal, Khoju, Rusch, & Harnisch, 1999). In addition, this study provided little support for past

research focused on the importance of parental involvement and parental expectations toward their child's future (Doren et al., 2012; Lindstrom et al., 2007; Morningstar et al., 2010; Thompson et al., 2001; Wagner et al., 2003). One possible reason could be that this study only investigated this issue using an extant dataset that primarily included dichotomous variables. Future research should be mindful of these antithetical findings and collect additional data to examine predictors that were excluded in this study due to either high levels of missing data or were not included in NLTS-2 surveys. This would extend current research and practice regarding malleable factors associated with productive and meaningful adult outcomes given what we know. Effective transition services and policies should be developed to lift the expectations toward individuals with significant disabilities. Continued attention both in research and practice related to students with significant disabilities, and support for developing inclusive community participation is needed to lead to both policy and practice shifts for long-term support.

Summary

Key findings, limitations, and implications were presented in this chapter. This study resulted in specific findings in three areas: (a) descriptive understanding of community participation outcomes among youth with significant disabilities; (b) the role associated with access to social networks while in school as predicting of post-high school community involvement and social engagement; and (c) the role of a youth's functional skills in predicting post-high school community involvement. Cautions interpretations of key findings are warranted given the issues associated with the measurement and specifically survey item characteristics, sample size, analytic procedures, and variable selection. Finally, suggestions for additional research and practical implications were offered to improve meaningful community participation of youth with significant disabilities and to support their ongoing needs.

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Table 1

Demographic information for Unweighted Sample

	Characteristics	Number	Percentage
Race/Ethnicity	White	300	63.8
	African-American	100	20.5
	Hispanic	60	13.2
	Others	10	2.5
Family Income	$25,000 or less	150	31.1
	$25,001 - $50,000	130	26.9
	More than $50,000	160	33.7
Gender	Male	310	67.0
	Female	160	33.0
Disability Category	Intellectual disability	120	24.7
	Autism	170	36.2
	Multiple disabilities	160	33.9
	Deaf-blindness	20	5.1
Age when school data was collected	13	20	4.7
	14	90	18.8
	15	130	27.7
	16	150	31.6
	17	80	17.3

Note. N = 470. Rounded to nearest 10.

Table 2

Criterion Variables: Community Participation

	Variables	Range of Responses	Sources
Community presence (CP)	CP01 Youth spent time shopping/hanging out at the mall/cafes/coffee shops	0 = no; 1 = yes	P3_J11_14
	CP02 Youth spent time doing outdoor physical activities: playing sports, jogging, swimming, biking, skating	0 = no; 1 = yes	P3_J11_13
	CP03 Youth spent time doing indoor physical activities: exercising, working out, going to the gym	0 = no; 1 = yes	P3_J11_23
	CP04 Youth spent time going out to eat/ going to restaurants/ eating out	0 = no; 1 = yes	P3_J11_24
	CP05 Youth spent time going to bars/ clubs/ partying	0 = no; 1 = yes	P3_J11_25
	CP06 Youth spent time going to church/ church activities	0 = no; 1 = yes	P3_J11_28
	CP07 Youth spent time traveling/ going to a camp/ vacation	0 = no; 1 = yes	P3_J11_26
	CP08 Youth spent time doing other outdoor activities: camping/ fishing/ boating/ riding ATVs/ hunting/ shooting	0 = no; 1 = yes	P3_J11_29
	CP09 Getting therapies, medical attention, visiting doctor, recovering from illness/injury	0 = no; 1 = yes	P3_J11_30
	CP10 Youth spent time attending entertainment/events	0 = no; 1 = yes	P3_J11_20
Community involvement (CI)	CI01Youth participated in an out-of-school group activity (community activities) in the past 12 months	0 = no; 1 = yes	P6_A4h, P6_J2
	CI02 Youth participated in volunteer/community service in the past 12 months	0 = no; 1 = yes	P8_J4
	CI03 Youth is registered to vote	0 = no; 1 = yes	U9_J16
	CI04 Youth has a driving license or learners permit	0 = no; 1 = yes	P15_J13
	CI05 Youth has a savings or checking account	0 = no; 1 = yes	P16_J14b_[a,b]
	CI06 Youth has charge accounts in his or her own name	0 = no; 1 = yes	P16_J14b_c
	CI07 Youth has taken any classes from a 2-year or community college in the last 2 years	0 = no; 1 = yes	S3a2_A3b
	CI08 Youth worked for pay during the last 2 years	0 = no; 1 = yes	T1b_A4b
Social engagement (SE)	SE01 Youth was invited to social activities with friends in the past 12months	0 = no; 1 = yes	P11_J7
	SE02 Youth spent time visiting or playing with friends	0 = no; 1 = yes	P3_J11_02
	SE03 During the last 12 months, number of days per week youth usually gets together with friends	0 = never; 1 = sometimes; 2 = 1 day a week; 3 = 2-3 days a week; 4 = 4-5 days a week; 5 = 6-7 days a week	P10_J6

Table 3

Predictor Variables: Youth-level Domain
Table 4

	Variables	Range of Responses	Sources
Functional skills (FSS)	How well youth does the following on his own without help: FSS01 Tell time on a clock with hands FSS02 Read and understand common signs FSS03 Count change FSS04 Look up telephone numbers in a phonebook and use the telephone	1 = not at all well; 2 = not very well; 3 = pretty well; 4 = very well	np1G4[a-d]
	How well youth does the following on his own without help: SCS01 Dress him/her self completely SCS02 Feed him/her self completely	1 = not at all well; 2 = not very well; 3 = pretty well; 4 = very well	np1G3[a,b]
	How often youth does: HRS01 Fix his/her breakfast or lunch HRS02 Do laundry HRS03 Straighten up his/her own room	1 = always; 2 = usually; 3 = sometimes; 4 = never	np1G5[a-c]
Social skills (SS)	How often youth behaves this way: SS01 Joins group activities without being told to SS02 Makes friends easily SS03 Ends disagreements with you calmly SS04 Seems self confident in social situations SS05 Gets into situations that are likely to result in trouble	0 = never; 1 = sometimes; 2 = very often	np1G1[a-e] np1G1[g-i]
Communication skills (CS)	CS01 How clearly youth speak CS02 How well youth communicate CS03 How well youth carries on a conversation CS04 How well youth understand what people say	1 = do just as well as others; 2 = has a little trouble; 3 = has a lot of trouble; 4 = does not do at all	np1B5[a-b] np1B5[d-e] np1G1[f,k]
	How often youth behaves this way: SS06 Starts conversations rather than writing for others to start SS11 Speaks in an appropriate tone at home	0 = never; 1 = sometimes; 2 = very often	
Role in transition planning (RTP)	RTP01 Student role in his or her transition planning	1 = not attended; 2 = participated very little or not at all; 3 = moderately active participant; 4 = leadership role	npr1E9 npr2E9
Classroom behaviors (CB)	Frequency with which student does each of the following in his/her special education class: CB01 Stay focused on class work CB02 Withdraw from social contact or class activities CB03 Perform up to his or her ability CB04 Follow directions	1 = rarely; 2 = sometimes; 3 = frequently; 4 = almost always	npr1D19[c-e] npr1D18[b,d] np1G1j
	CB05 Ask for what he/she needs in order to do his/her best	0 = never; 1 = sometimes; 2 = very often	
	How often youth behaves this way: SS10 Keeps working at something until he or she is finished		

Predictor Variables: Family-level Domain

	Variables	Range of Responses	Sources
Involvement in education (IE)	How often an adult in the household has done the following since the beginning of the elementary, middle, junior, or senior high school year: IGE01 Attending general school meeting IGE02 Attending school or class events IGE03 Volunteering at the school IGE04 Going to parent/teacher conference	0 = never; 1 = 1-2 times; 2 = 3-4 times; 3 = 5-6 times; 4 = more than 6 times	np1F[a-d]2 np1E2a
	ISE01 Adult in household went to IEP meeting for special education program	0 = no; 1 = yes	
Outcome expectation (OE)	Likelihood that youth will: OE01 Attend postsecondary school OE02 Get a drivers license OE03 Live away from home without suspension OE04 Get a paid job	1 = definitely will; 2 = probably will; 3 = probably won't; 4 = definitely won't	np1J[2,6] np1J[7,9]
Family support (FS)	FS01 How often an adult in youth's household spoke to youth about his or her school experiences	1 = not at all; 2 = rarely; 3 = occasionally; 4 = regularly	np1E7

Table 5

Predictor Variables: School-level Domain

	Variables	Range of Responses	Sources
Inclusion (IC)	IC01 Percent of time in academics in general education	0 – 100%	ntsPctHr_Acad_Gpl_ZF
Access to the general curriculum (AGC)	AGC01 Had English courses AGC02 Had Math courses AGC01Had Science courses	0 = no; 1 = yes	ntsHad_Eng ntsHad_Math ntsHad_Sci
Accommodation/modifications (AM)	AM01-11 Accommodations/modifications provided to the student: More time in taking tests; test read to student; modified tests; alternative tests or assessments; modified grading standards; slower-paced instruction; additional time to complete assignments; shorter or different assignments; more frequent feedback; physical adaptations; large print or Braille books or large print computer	0 = no; 1 = yes	npr1D3a[01-11]
Access to the social networks (ASN)	Primary goals for student in 2001-2002 school year is building social skills ASN01 Youth has participated in school activity outside of class in the 12 months ASN02 Youth has participated in out-of-school activities in the past 12 months ASN03 Youth has done volunteer/community service in past 12 months	0 = no; 1 = yes	npr1D43 np1F[3,4,7]
Access to the vocational programs (AVP)	Primary goals for student in 2001-2002 school year: AVP01 Develop prevocational skills AVP02 Develop vocational skills AVP03, 06, 07, 12, 14 This student has received the following classes from or through the school system since starting high school: Formal assessment of career skills or interests; instruction in looking for jobs; job shadowing, work exploration; specific job skills training; job coach	0 = no; 1 = yes	npr1D4[9-10] npr1C14[01-12] npr2C14[01-12]

Table 6

Predictor Variables: Community-level Domain

	Variables	Range of Responses	Sources
Type of community (TC)	TC01 Description of the community in which this school is located	1 = rural; 2 = small city; 3 = medium-sized city; 4 = suburb of medium-sized city; 5 = large city; 6 = suburb of large city; 7 = very large city; 8 = suburb of very large city; 9 = military base or station; 10 = Indian reservation	nsc1A7
Accessibility to community (AC)	AC01 How well youth get to places outside the home	1 = not at all; 2 = not very well; 3 = pretty well; 4 = very well	np1G4e
Accessibility to transportation (AT)	AT01 How well youth use public transportation to get around town	1 = not at all; 2 = not very well; 3 = pretty well; 4 = very well	np2G3a_f

Table 7

Missing Data for Unweighted Sample: Criterion Variables

Variables	Missing Cases	Missing Percentage
Community Presence		
CP01 Youth spent time shopping/hanging out at the mall/cafes/coffee shops	110	22.6
CP02 Youth spent time doing outdoor physical activities: playing sports, jogging, swimming, biking, skating	100	22.2
CP03 Youth spent time doing indoor physical activities: exercising, working out, going to the gym	110	23.5
CP04 Youth spent time going out to eat/ going to restaurants/ eating out	110	23.5
CP05 Youth spent time going to bars/ clubs/ partying	110	23.5
CP06 Youth spent time going to church/ church activities	110	23.5
CP07 Youth spent time traveling/ going to a camp/ vacation	110	23.0
CP08 Youth spent time doing other outdoor activities: camping/ fishing/ boating/ riding ATVs/ hunting/ shooting	110	23.5
CP09 Getting therapies, medical attention, visiting doctor, recovering from illness/injury	110	23.0
CP10 Youth spent time attending entertainment/events	110	22.8
Community Involvement		
CI01Youth participated in an out-of-school group activity (community activities) in the past 12 months	50	10.4
CI02 Youth participated in volunteer/community service in the past 12 months	100	21.1
CI03 Youth is registered to vote	100	22.0
CI04 Youth has a driving license or learners permit	100	21.5
CI05 Youth has a savings or checking account	100	20.9
CI06 Youth has charge accounts in his or her own name	110	22.6
CI07 Youth has taken any classes from a 2-year or community college in the last 2 years	60	13.2
CI08 Youth worked for pay during the last 2 years	60	13.4
Social Engagement		
SE01 Youth was invited to social activities with friends in the past 12months	90	19.8
SE02 Youth spent time visiting or playing with friends	110	23.0
SE03 During the last 12 months, number of days per week youth usually gets together with friends	100	20.7

Note. N = 470. Rounded to nearest 10.

Table 8

Missing Data for Unweighted Sample: Youth-level Domain

Variables	Missing Cases	Missing Percentage
FSS01 Tell time on a clock with hands	<10	1.3
FSS02 Read and understand common signs	<10	1.5
FSS03 Count change	<10	1.5
FSS04 Look up telephone numbers in a phonebook and use the telephone	<10	1.5
SCS01 Dress him/her self completely	<10	-
SCS02 Feed him/her self completely	<10	-
HRS01 Fix his/her breakfast or lunch	<10	-
HRS02 Do laundry	<10	-
HRS03 Straighten up his/her own room	<10	1.3
SS01 Joins group activities without being told to	<10	-
SS02 Makes friends easily	<10	-
SS03 Ends disagreements with you calmly	20	4.3
SS04 Seems self confident in social situations	<10	-
SS05 Gets into situations that are likely to result in trouble	<10	2.1
CS01 How clearly youth speak	40	7.9
CS02 How well youth communicate	10	2.8
CS03 How well youth carries on a conversation	10	2.3
CS04 How well youth understand what people say	10	2.6
SS06 Starts conversations rather than writing for others to start	<10	-
SS11 Speaks in an appropriate tone at home	10	1.3
RTP01 Student role in his or her transition planning	70	14.5
CB01 Stay focused on class work	120	26.2
CB02 Withdraw from social contact or class activities	130	26.7
CB03 Perform up to his or her ability	130	27.1
CB04 Follow directions	120	26.0
CB05 Ask for what he/she needs in order to do his/her best	130	27.1
SS10 Keeps working at something until he or she is finished	10	1.3

Note. N = 470. Rounded to nearest 10.

Table 9

Missing Data for Unweighted Sample: Family-level Domain

Variables	Missing Cases	Missing Percentage
IGE01 Attending general school meeting	20	5.1
IGE02 Attending school or class events	30	5.3
IGE03 Volunteering at the school	20	5.1
IGE04 Going to parent/teacher conference	20	4.1
ISE01 Adult in household went to IEP meeting for special education program	20	5.1
OE01 Attend postsecondary school	20	3.2
OE02 Get a drivers license	10	2.8
OE03 Live away from home without suspension	20	4.3
OE04 Get a paid job	30	5.3
FS01 How often an adult in youth's household spoke to youth about his or her school experiences	40	7.9

Note. N = 470. Rounded to nearest 10.

Table 10

Missing Data for Unweighted Sample: School-level Domain

Variables	Missing Cases	Missing Percentage
IC01 Percent of time in academics in general education	200	42.6
AGC01 Had English courses	120	25.2
AGC02 Had Math courses	120	25.2
AGC03 Had Science courses	120	25.2
AM01 More time in taking tests	50	10.4
AM02 Test read to student	49	10.4
AM03 Modified tests	49	10.4
AM04 Alternative tests or assessments	49	10.4
AM05 Modified grading standards	49	10.4
AM06 Slower-paced instruction	49	10.4
AM07 Additional time to complete assignments	49	10.4
AM08 Shorter or different assignments	49	10.4
AM09 More frequent feedback	49	10.4
AM10 Physical adaptations	49	10.4
AM11 Large print or Braille books or large print computer	49	10.4
ASN01 Youth has participated in school activity outside of class in the 12 months	20	4.7
ASN02 Youth has participated in out-of-school activities in the past 12 months	<10	-
ASN03 Youth has done volunteer/community service in past 12 months	<10	-
AVP01 Develop prevocational skills	50	10.2
AVP02 Develop vocational skills	50	10.2
AVP03 Formal assessment of career skills or interests	119	25.4
AVP06 Instruction in looking for jobs	126	26.9
AVP07 Job shadowing, work exploration	129	27.5
AVP12 Specific job skills training	128	27.3
AVP14 Job coach	126	26.9

Note. N = 470. Rounded to nearest 10.

Table 11

Missing Data for Unweighted Sample: Community-level Domain

Variables	Missing Cases	Missing Percentage
TC01 Description of the community in which this school is located	30	7.2
AC01 How well youth get to places outside the home	<10	1.7
AT01 How well youth use public transportation to get around town	80	16.6

Note. N = 470. Rounded to nearest 10.

Table 12

Descriptive Information of Criterion Variables: Community Presence

Variables	Cases 0.00	Cases 1.00	Total Cases	M	SD
Youth spent time:					
CI01 shopping/hanging out at the mall/cafes/coffee shops	330 (92%)	30 (8%)	360	.07	.27
CI02 doing outdoor physical activities: playing sports, jogging, swimming, biking, skating	290 (78%)	80 (22%)	100	.22	.41
CI03 doing indoor physical activities: exercising, working out, going to the gym	350 (97%)	10 (3%)	110	.03	.17
CI04 going out to eat/ going to restaurants/ eating out	360 (100%)	0 (0%)	360	.00	.00
CI05 going to bars/ clubs/ partying	350 (99%)	5 (1%)	110	.01	.12
CI06 going to church/ church activities	330 (91%)	30 (9%)	110	.09	.29
CI07 traveling/ going to a camp/ vacation	350 (97%)	10 (3%)	110	.03	.17
CI08 doing other outdoor activities: camping/ fishing/ boating/ riding ATVs/ hunting/ shooting	360 (99%)	2 (1%)	110	.01	.07
CI09 getting therapies, medical attention, visiting doctor, recovering from illness/injury	360 (99%)	3 (1%)	110	.01	.09
CI10 attending entertainment/events	310 (87%)	50 (13%)	110	.13	.34

Note. N = 470; Rounded to nearest 10; M = Mean; SD = Standard Deviation.

Table 13

Descriptive Information of Criterion Variables: Community Involvement

Variables	Cases 0.00	Cases 1.00	Total Cases	M	SD
CP01 Youth participated in an out-of-school group activity (community activities) in the past 12 months	210 (50%)	210 (50%)	420	.50	.50
CP02 Youth participated in volunteer/community service in the past 12 months	260 (71%)	110 (29%)	370	.29	.46
CP03 Youth is registered to vote	240 (66%)	130 (27%)	370	.34	.48
CP04 Youth has a driving license or learners permit	330 (89%)	40 (11%)	370	.11	.31
CP05 Youth has a savings or checking account	140 (39%)	230 (61%)	370	.61	.49
CP06 Youth has charge accounts in his or her own name	320 (95%)	40 (12%)	360	.12	.33
CP07 Youth has taken any classes from a 2-year or community college in the last 2 years	390 (95%)	20 (5%)	410	.05	.22
CP08 Youth worked for pay during the last 2 years	250 (62%)	160 (38%)	410	.38	.49

Note. N = 470; Rounded to nearest 10; M = Mean; SD = Standard Deviation.

Table 14

Descriptive Information of Criterion Variables: Social Engagement

Variables	Cases 0.00	Cases 1.00	Cases 2.00	Cases 3.00	Cases 4.00	Cases 5.00	Total Case	M	SD
SE01 Youth was invited to social activities with friends in the past 12 months	190 (50%)	190 (51%)	-	-	-	-	380	.51	.50
SE02 Youth spent time visiting or playing with friends	320 (90%)	40 (11%)	-	-	-	-	360	.11	.31
SE03 During the last 12 months, number of days per week youth usually gets together with friends	130 (36%)	80 (21%)	60 (16%)	70 (18%)	20 (5%)	20 (5%)	370	1.49	1.48

Note. N = 470; Rounded to nearest 10; M = Mean; SD = Standard Deviation.

Table 15

Factor Loadings for Best Models of Criterion Variables Constructs

	Factor Loadings	*p* value
Community Presence (CP) Construct		
CP01	**.65**	< .01
CP02	.36	.019
CP03	**.80**	< .01
CP04	-	-
CP05	**.65**	< .01
CP06	**.60**	< .01
CP07	.37	.247
CP08	.53	.07
CP09	.34	.017
CP10	-.09	.618
Community Involvement (CI) Construct		
CI01	**.48**	< .01
CI02	**.52**	< .01
CI03	**.53**	< .01
CI04	-	-
CI05	**.38**	< .01
CI06	-	-
CI07	-	-
CI08	**.57**	< .01
Social Engagement (SE) Construct		
SE01	**.58**	< .01
SE02	**.63**	< .01
SE03	**.85**	< .01

Note. Factor loadings > .30 are in boldface. See Table 2 for descriptions above variables.

Table 16

Factor Loadings for Best Models of Youth-Level Predictor Variables Constructs

	Factor Loadings	*p* value
Functional Skills (FSS) Construct		
FSS01	**.88**	< .01
FSS02	**.81**	< .01
FSS03	**.85**	< .01
FSS04	**.79**	< .01
SCS01	**.76**	< .01
SCS02	.79	< .01
HRS01	**.67**	< .01
HRS02	**.48**	< .01
HRS03	**.58**	< .01
Social Skills (SS) Construct		
SS01	.27	< .01
SS02	**.38**	< .01
SS03	**.54**	< .01
SS04	**.93**	< .01
SS05	**.88**	< .01
Communication Skills (CS) Construct		
CS01	**.43**	< .01
CS02	.30	< .01
CS03	**.98**	< .01
CS04	**.60**	< .01
SS06	.07	.226
SS11	.26	< .01
Role in Transition Planning (RTP) Construct		
RTP01	.46	< .01
Classroom Behaviors (CB) Construct		
CB01	**.78**	< .01
CB02	**.61**	< .01
CB03	**.88**	< .01
CB04	-.35	< .01
CB05	**.78**	< .01
SS10	.15	.019

Note. Factor loadings > .30 are in boldface. See Table 3 for descriptions above variables.

Table 17

Factor Loadings for Best Models of Family-Level Predictor Variables Constructs

	Factor Loadings	*p* value
Involvement in Education (IE) Construct		
IGE01	**.53**	< .01
IGE02	**.71**	< .01
IGE03	**.72**	< .01
IGE04	**.37**	< .01
ISE01	**.40**	< .01
Outcome Expectation (OE) Construct		
OE01	**.51**	< .01
OE02	**.87**	< .01
OE03	**.95**	< .01
OE04	**.63**	< .01
Family Support (FS) Construct		
FS01	.89	< .01

Note. Factor loadings > .30 are in boldface. See Table 4 for descriptions above variables.

Table 18

Factor Loadings for Best Models of School-Level Predictor Variables Constructs

	Factor Loadings	*p* value
Inclusion (IC) Construct		
IC01	.68	< .01
Access to General Curriculum (AGC) Construct		
AGC01	.77	.13
AGC02	.99	.12
AGC03	.58	.15
Accommodation Modification (AM) Construct		
AMM01	**.89**	< .01
AMM02	**.84**	< .01
AMM03	**.88**	< .01
AMM04	.25	< .01
AMM05	**.62**	< .01
AMM06	**.57**	< .01
AMM07	**.90**	< .01
AMM08	**.73**	< .01
AMM09	**.67**	< .01
AMM10	.09	.191
AMM11	.29	.016
Access to the Social Networks (ASN) Construct		
ASN01	**.48**	< .01
ASN02	**.71**	< .01
ASN03	**.52**	< .01
Access to the Vocational Programs (AVP) Construct		
AVP01	.09	.245
AVP02	.38	.168
AVP03	**.59**	< .01
AVP06	**.65**	< .01
AVP07	**.83**	< .01
AVP12	**.64**	< .01
AVP14	**.69**	< .01

Note. Factor loadings > .30 are in boldface. See Table 5 for descriptions above variables.

Table 19

Factor Loadings for Best Models of Community-Level Predictor Variables Constructs

	Factor Loadings	*p* value
Community Factors (CF) Construct		
TC01	-.25	.001
AC01	**.83**	< .01
AT01	**.68**	< .01

Note. Factor loadings > .30 are in boldface. See Table 6 for descriptions above variables.

Table 20

AIC and BIC for Best and Near-Best Models of Criterion Constructs

Model	Constructs (Indicators)	AIC	BIC
1	CP (CP01, CP03, CP05, CP06)	5499.880	5659.617
	CI (CI01, CI02, CI03, CI05, CI08)		
	SE (SE01, SE02, SE03)		
2	CP (CP01, CP03, CP05, CP06)	3035.297	3112.816
	CI (CI01, CI02, CI03, CI05, CI08)		
3	CP (CP01, CP03, CP05, CP06)	2448.857	2524.214
	SE (SE01, SE02, SE03)		
4	**CI (CI01, CI02, CI03, CI05, CI08)**	**4317.513**	**4403.431**
	SE (SE01, SE02, SE03)		

Note. The best model confirmed based on the lowest AIC and BIC estimates in boldface.

Table 21

AIC and BIC for Best and Near-Best Models of Youth-Level Predictor Variables Constructs

Model	Constructs (Indicators)	AIC	BIC
1	FSS (FS01- FS04, SCS01, HRS01, HRS02)	16965.746	17289.493
	SS (SS02, SS03, SS04, SS05)		
	CS (CS01, CS03, CS04)		
	CB (CB01, CB02, CB03, CB05)		
2	SS (SS02, SS03, SS04, SS05)	6383.850	6504.217
	CB (CB01, CB02, CB03, CB05)		
3	CS (CS01, CS03, CS04)	6062.655	6183.023
	CB (CB01, CB02, CB03, CB05)		
4	SS (SS02, SS03, SS04, SS05)	6530.535	6634.246
	CS (CS01, CS03, CS04)		
5	FSS (FS01- FS04, SCS01, HRS01, HRS02)	14142.275	14403.763
	SS (SS02, SS03, SS04, SS05)		
	CB (CB01, CB02, CB03, CB05)		
6	FSS (FS01- FS04, SCS01, HRS01, HRS02)	11158.607	11345.192
	SS (SS02, SS03, SS04, SS05)		
7	FSS (FS01- FS04, SCS01, HRS01, HRS02)	10621.000	10824.379
	CS (CS01, CS03, CS04)		
8	**FSS (FS01- FS04, SCS01, HRS01, HRS02)**	**10184.984**	**10371.665**
	CB (CB01, CB02, CB03, CB05)		

Note. The best model confirmed based on the lowest AIC and BIC estimates in boldface.

Table 22

AIC and BIC for Best and Near-Best Models of Family-Level Predictor Variables Constructs

Model	Constructs (Indicators)	AIC	BIC
1	**IE (IGE01-IGE05, ISE01)** **OE (OE01-OE04)**	**6988.874**	**7129.922**

Note. The best model confirmed based on the lowest AIC and BIC estimates in boldface.

Table 23

AIC and BIC for Best and Near-Best Models of School-Level Predictor Variables Constructs

Model	Constructs (Indicators)	AIC	BIC
1	AM (AMM01-AMM03, AMM05- AMM09) ASN (ASN01, ASN02, ASN03) AVP (AVP03, AVP06, AVP07, AVP12, AVP14)	7476.684	7617.805
2	AM (AMM01-AMM03, AMM05- AMM09) AVP (AVP03, AVP06, AVP07, AVP12, AVP14)	5740.023	5846.279
3	AM (AMM01-AMM03, AMM05- AMM09) ASN (ASN01, ASN02, ASN03)	5530.703	5622.016
4	**ASN (ASN01, ASN02, ASN03)** **AVP (AVP03, AVP06, AVP07, AVP12, AVP14)**	**3636.854**	**3707.414**

Note. The best model confirmed based on the lowest AIC and BIC estimates in boldface.

Table 24

AIC and BIC for Best and Near-Best Models of Community-Level Predictor Variables Constructs

Model	Constructs (Indicators)	AIC	BIC
1	**CF (AC01, AT01)**	**1661.997**	**1694.799**

Note. The best model confirmed based on the lowest AIC and BIC estimates in boldface.

Table 25

Constructs, AIC, and BIC for Best and Near-Best Models of Finalized Model

Model	Constructs	AIC	BIC
1	CI, SE, FSS, ASN	13634.048	13899.687
2	CI, SE, IE, CB	11487.075	11748.158
3	CI, SE, OE, CB	10778.646	11015.109
4	CI, SE, IE, AVP	10444.058	10680.398
5	CI, SE, OE, AVP	9723.731	9935.303
6	CI, SE, OE, ASN	9483.355	9678.434
7	CI, SE, ASN, AVP	7927.656	8101.982
8	CI, SE, FSS, ASN, IE	17836.448	18205.852
9	CI, SE, FSS, ASN, CB	16628.707	16977.357
10	CI, SE, OE, AVP, IE	13964.697	14284.293
11	**CI, SE, FSS, ASN, CB, AVP**	**18517.934**	**18928.843**

Note. The best model confirmed in boldface.

Table 26

Brief Descriptions of Empirically Verified Constructs, Sources, and Modifications

Description of Constructs		NLTS-2 Source and Indicators	Modifications from conceptual framework
Community participation outcome constructs			
Community Involvement (CI)	Youth involvement in community (community activities, volunteer/community services, registration to vote, savings or checking account, paid job)	Wave 4 and 5 Parent Youth Interview—P6_A4h; P6_J2; P8_J4; U9_J16; P16_J14b[a,b]; T1b_A4b	Items related to driving, credit card, postsecondary education dropped from model because of poor model fit
Social Engagement (SE)	Youth social interaction (participation in social activities , play with friends, level of participation getting together with friends)	Wave 4 and 5 Parent Youth Interview—P11_J7; P3_J11_02; P10_J6	N/A—Same as originally proposed construct
Youth-level predictor constructs			
Functional Skills (FSS)	Youth performance of tasks related to basic mental skills, self-care skills, household skills (Telling time, reading sings, counting change, using telephone, dressing, fixing meals, laundry, cleaning)	Wave 1 Parent Survey—np1G4[a-d]; np1G3a; np1G5[a-c]	One item related to feeding meals dropped from model because of high correlations between the items
Classroom Behaviors (CB)	Youth behavior in special education classes (Staying focused on work, withdrawing from activities, performing ability, asking for needs)	Wave 1 School Program Survey—npr1D19[c-e]; npr1D18d	Some conceptually identified items dropped from model because of poor model fit
School-level predictor constructs			
Access to the Social Networks (ASN)	Youth participated in school activities, social activities, and volunteer/community services	Wave 1 Parent Survey—np1F[3,4,7]	N/A—Same as originally proposed construct
Access to the Vocational Programs (AVP)	Youth access to the vocational classes (career assessment, job search instruction, job showing and work exploration, specific job skills training, job coach)	Wave 1 and 2 School Program Survey—npr1C14[01-12]; npr2C14[01-12]	Some conceptually identified items dropped from model because of poor model fit

Table 27

Factor Loadings of the Final Model

	Factor Loadings	*p* value
Community Involvement (CI) Construct		
CP01	**.34**	< .01
CP02	**.39**	< .01
CP03	**.75**	< .01
CP05	**.31**	< .01
CP08	**.50**	< .01
Social Engagement (SE) Construct		
SE01	**.64**	< .01
SE02	**.54**	< .01
SE03	**.59**	< .01
Functional Skills (FSS) Construct		
FSS01	**.85**	< .01
FSS02	**.80**	< .01
FSS03	**.82**	< .01
FSS04	**.79**	< .01
SCS01	**.76**	< .01
HRS01	**.65**	< .01
HRS02	**.46**	< .01
HRS03	**.56**	< .01
Classroom Behaviors (CB) Construct		
CB01	**.67**	< .01
CB02	**.71**	< .01
CB05	**.63**	< .01
Access to the Social Networks (ASN) Construct		
ASN01	**.45**	< .01
ASN02	**.52**	< .01
ASN03	**.57**	< .01
Access to the Vocational Program (AVP) Construct		
AVP03	**.64**	< .01
AVP06	**.82**	< .01
AVP07	**.70**	< .01
AVP12	**.48**	< .01
AVP14	**.50**	< .01

Note. Factor loadings > .30 are in boldface. See Table 2, 3, 5 for descriptions above variables.

Table 28

Parameter Estimates for the Model Predicting Community Participation

Variables	b	SE	B	p value
Functional skills <- Community involvement	**0.872**	**3.179**	**0.354**	**< .01**
Classroom behaviors <- Community involvement	0.261	1.748	0.106	.080
Access to social network <- Community involvement	**1.299**	**6.036**	**0.528**	**< .01**
Access to vocational programs <- Community involvement	0.371	2.288	0.150	.022
Functional skills <- Social engagement	-0.182	-0.969	-0.159	.333
Classroom behaviors <- Social engagement	-0.097	-0.789	-0.085	.430
Access to social network <- Social engagement	**0.494**	**3.499**	**0.431**	**< .01**
Access to vocational programs <- Social engagement	0.262	1.582	0.229	.114

Note. The significant predictors in boldface; N = 470, Rounded to nearest 10; b = raw coefficient; SE = Standard Deviation.

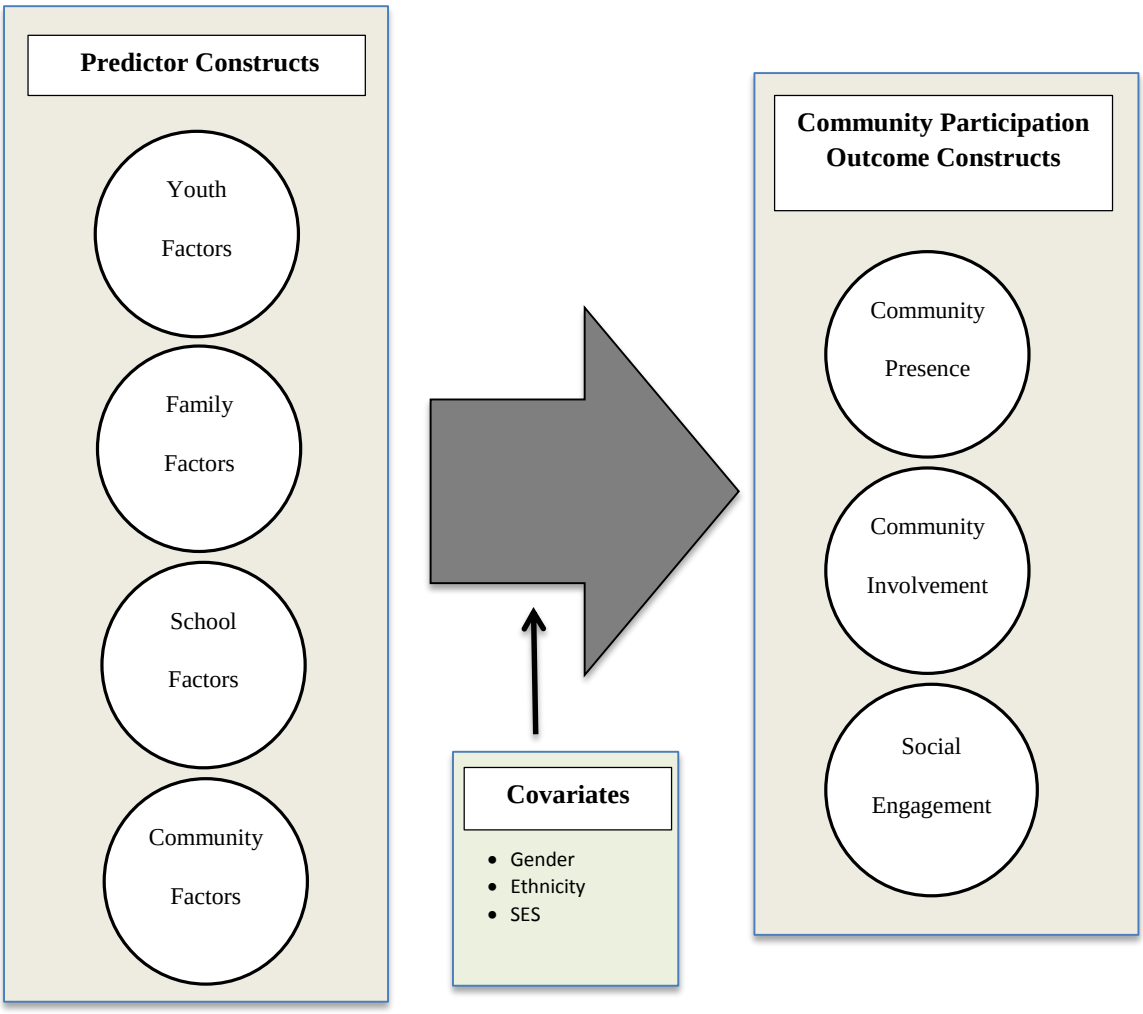
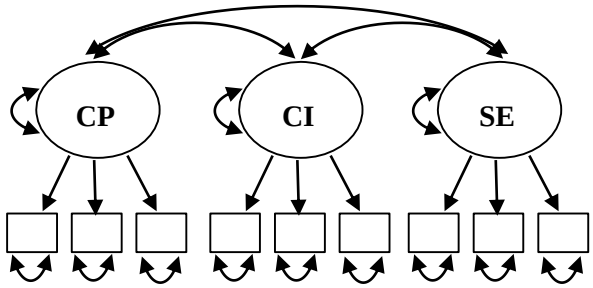
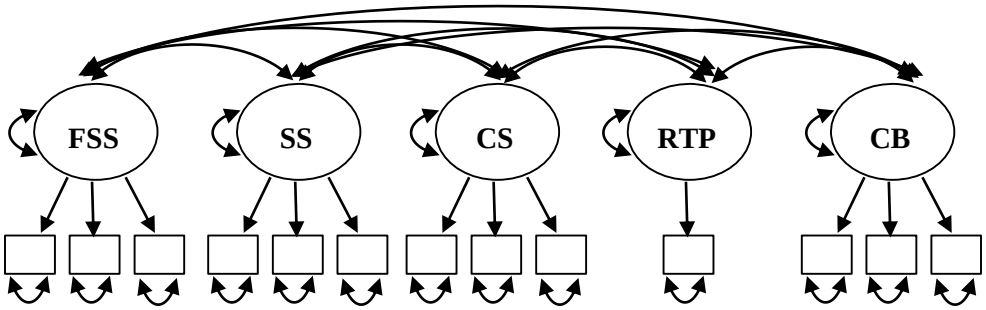


Figure 1. Logic model of investigation predictors of community participation of youth with significant disabilities from National Longitudinal Transition Study 2. The factor variance and unique factor variance are omitted for simplicity.

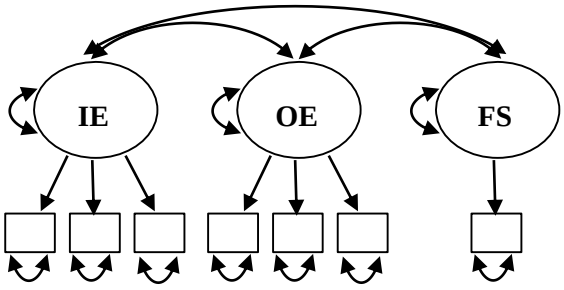
Community Participation Criterion Constructs:



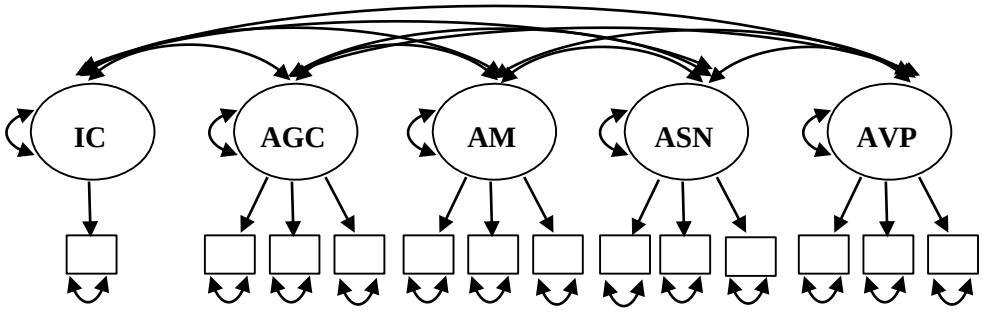
Youth-level Predictor Constructs:



Family-level Predictor Constructs:



School-level Predictor Constructs:



Community-level Predictor Constructs:

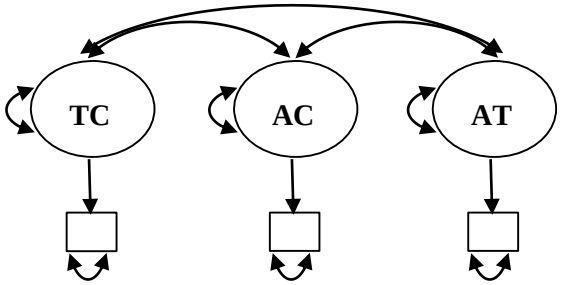
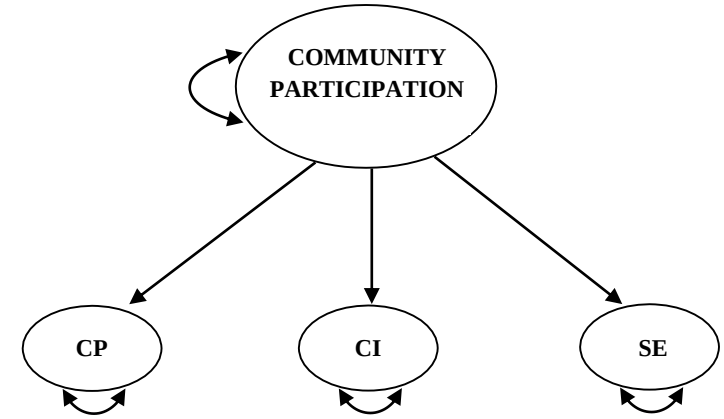
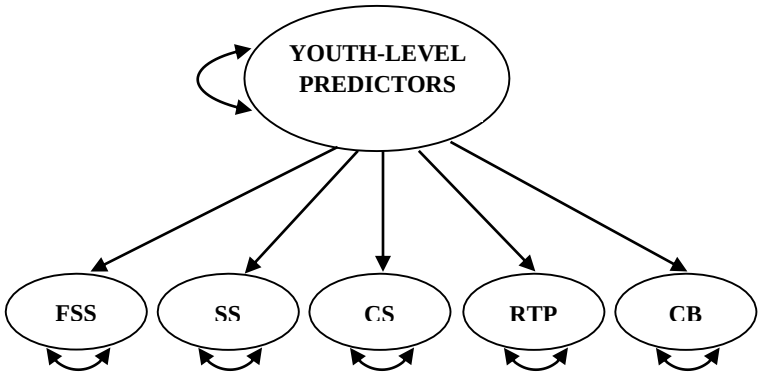
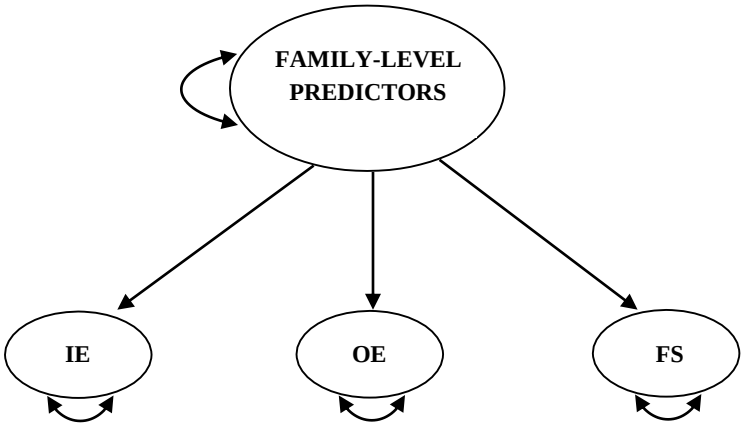


Figure 2. Hypothesized unidimensional latent constructs across criterion and predictor variables. CP = Community participation construct; CI = Community involvement construct; SE = Social engagement construct; FSS = Functional skills construct; SS = Social skills construct ; CS = Communication skills construct ; RTP = Role in transition planning; CB = Classroom behaviors construct; IE = Involvement in education construct; OE = Outcome expectation construct; FS = Family support construct; IC = Inclusion; AGC = Access to the general curriculum; AM = Accommodation modification construct; ASN = Access to the social networks construct; AVP = Access to the vocational program construct; TC = Type of community; AC = Accessibility to community; AT = Accessibility to transportation.


COMMUNITY PARTICIPATION
CP
CI
SE


YOUTH-LEVEL PREDICTORS
FSS
SS
CS
RTP
CB


FAMILY-LEVEL PREDICTORS
IE
OE
FS

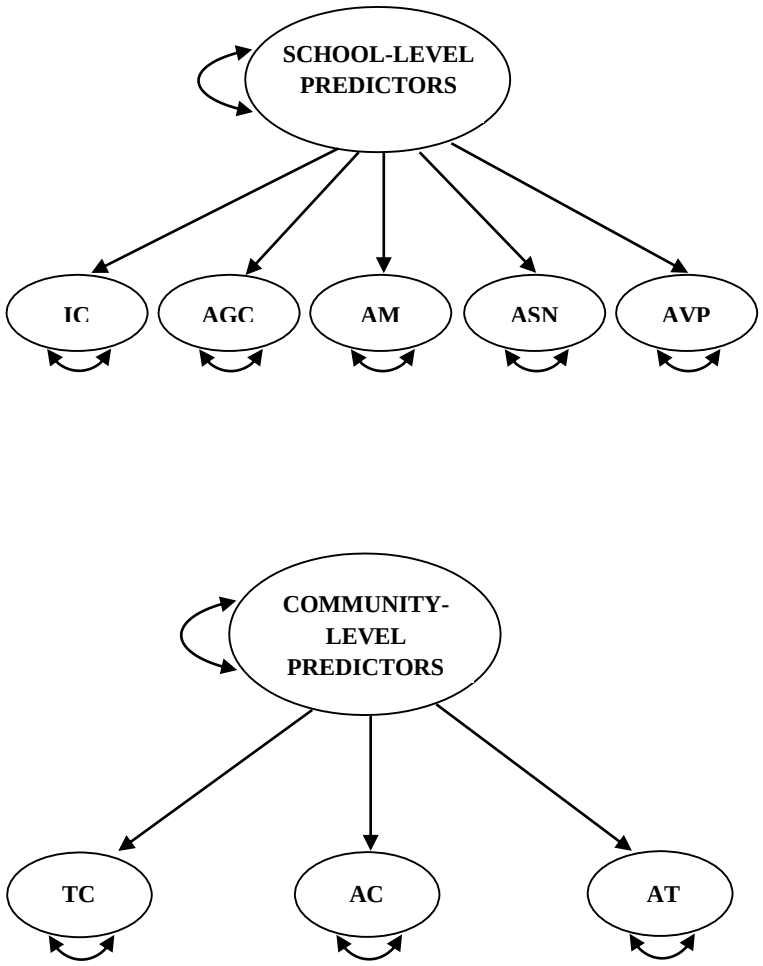


Figure 3. Hypothesized multidimensional latent constructs across criterion and predictor variables. CP = Community participation construct; CI = Community involvement construct; SE = Social engagement construct; FSS = Functional skills construct; SS = Social skills construct ; CS = Communication skills construct ; RTP = Role in transition planning; CB = Classroom behaviors construct; IE = Involvement in education construct; OE = Outcome expectation construct; FS = Family support construct; IC = Inclusion; AGC = Access to the general curriculum; AM = Accommodation modification construct; ASN = Access to the social networks construct; AVP = Access to the vocational program construct; TC = Type of community; AC = Accessibility to community; AT = Accessibility to transportation.

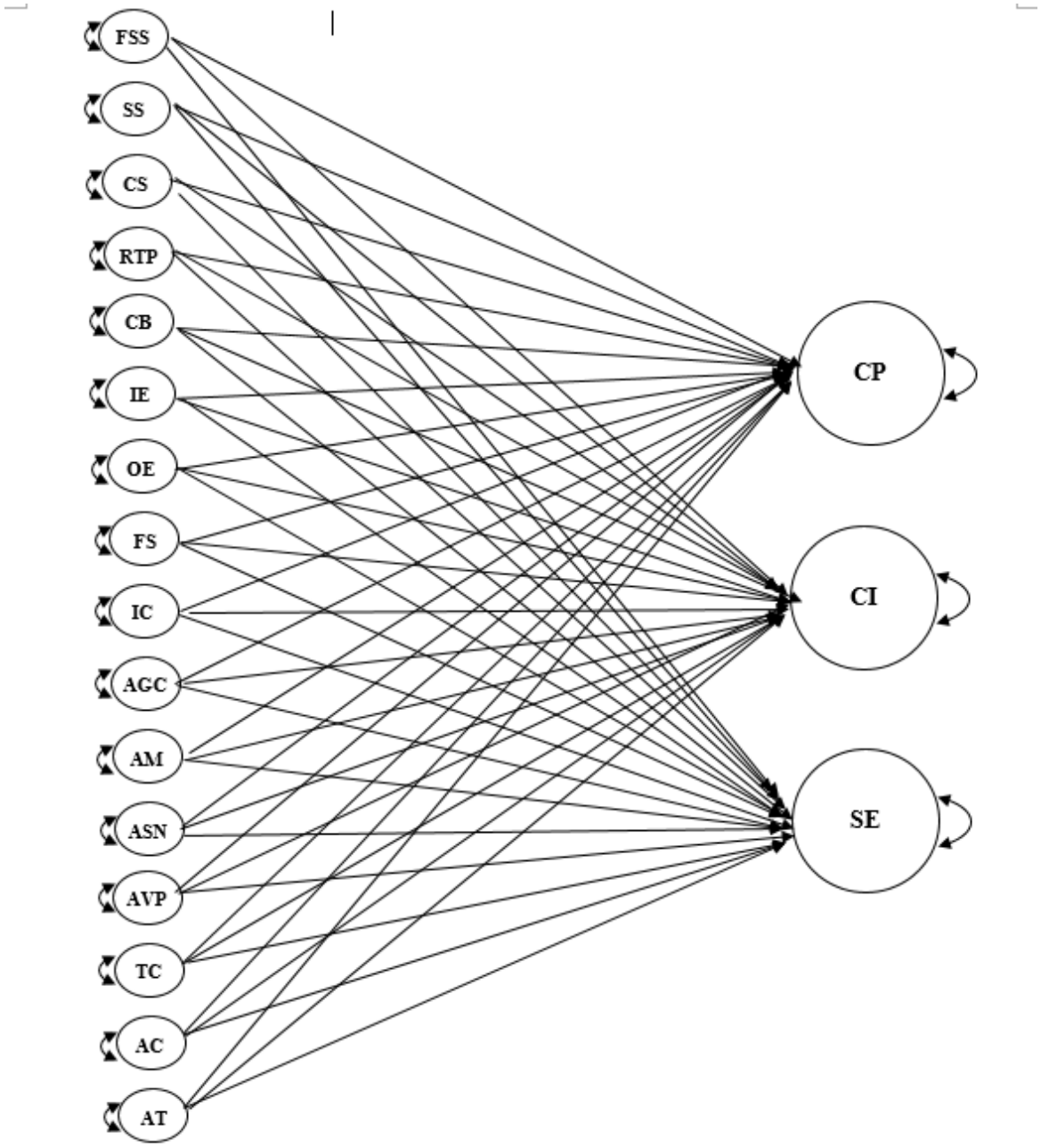


Figure 4. Hypothesized predictive paths of criterion and predictor constructs. Correlations among factors are not presented due to limited space. CP = Community participation construct; CI = Community involvement construct; SE = Social engagement construct; FSS = Functional skills construct; SS = Social skills construct ; CS = Communication skills construct ; RTP = Role in transition planning; CB = Classroom behaviors construct; IE = Involvement in education construct; OE = Outcome expectation construct; FS = Family support construct; IC = Inclusion; AGC = Access to the general curriculum; AM = Accommodation modification construct; ASN = Access to the social networks construct; AVP = Access to the vocational program construct; TC = Type of community; AC = Accessibility to community; AT = Accessibility to transportation.

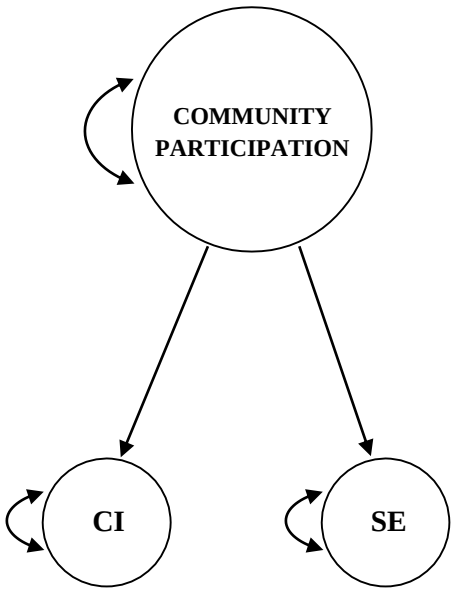


Figure 5. The multidimensional model of the latent criterion constructs. Correlations among factors are not presented due to limited space. CI = Community involvement construct; SE = Social engagement construct.

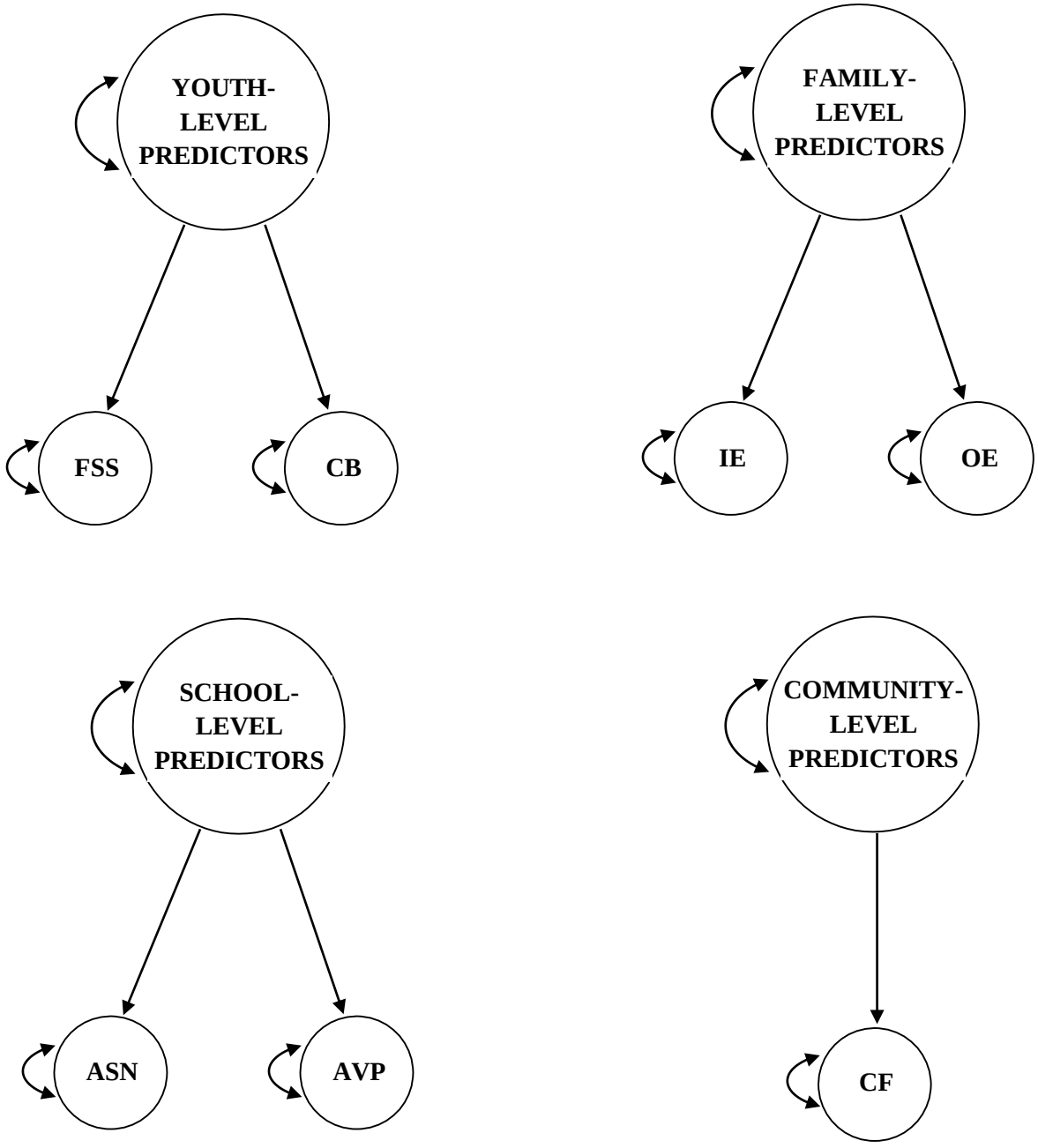


Figure 6. The multidimensional models of the latent predictor constructs. Correlations among factors are not presented due to limited space. FSS = Functional skills construct; CB = Classroom behaviors construct; IE = Involvement in education construct; OE = Outcome expectation construct; ASN = Access to the social networks construct; AVP = Access to the vocational program construct; CF = Community factors construct.

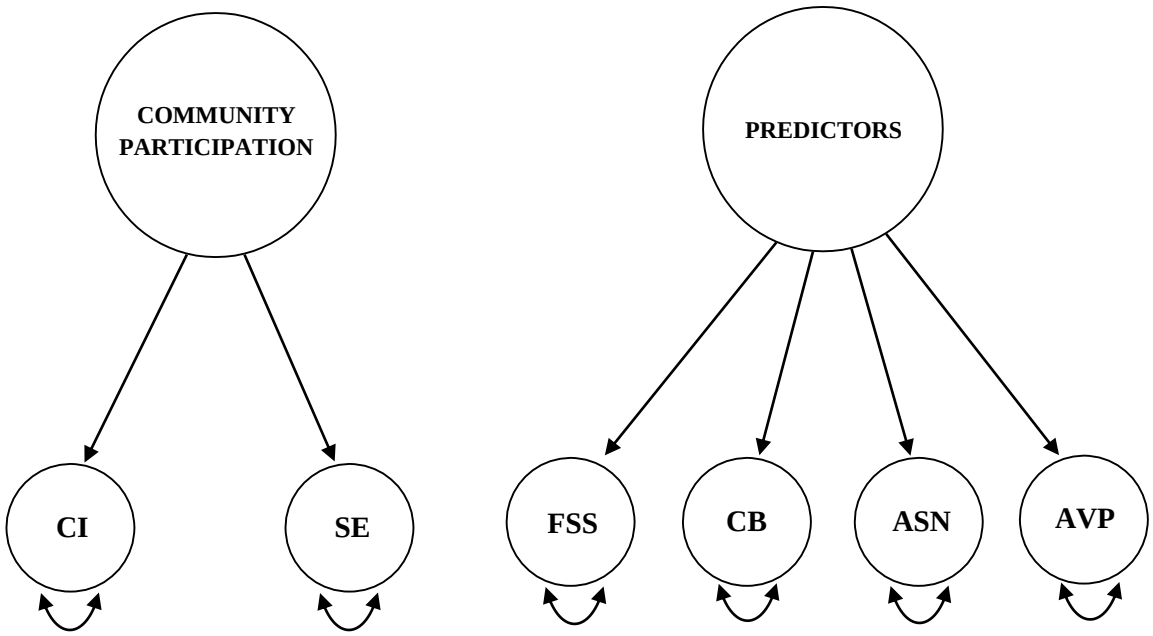


Figure 7. The final model. Correlations among factors are not presented due to limited space. CI = Community involvement construct; SE = Social engagement construct; FSS = Functional skills construct; CB = Classroom behaviors construct; ASN = Access to the social networks construct; AVP = Access to the vocational program construct.

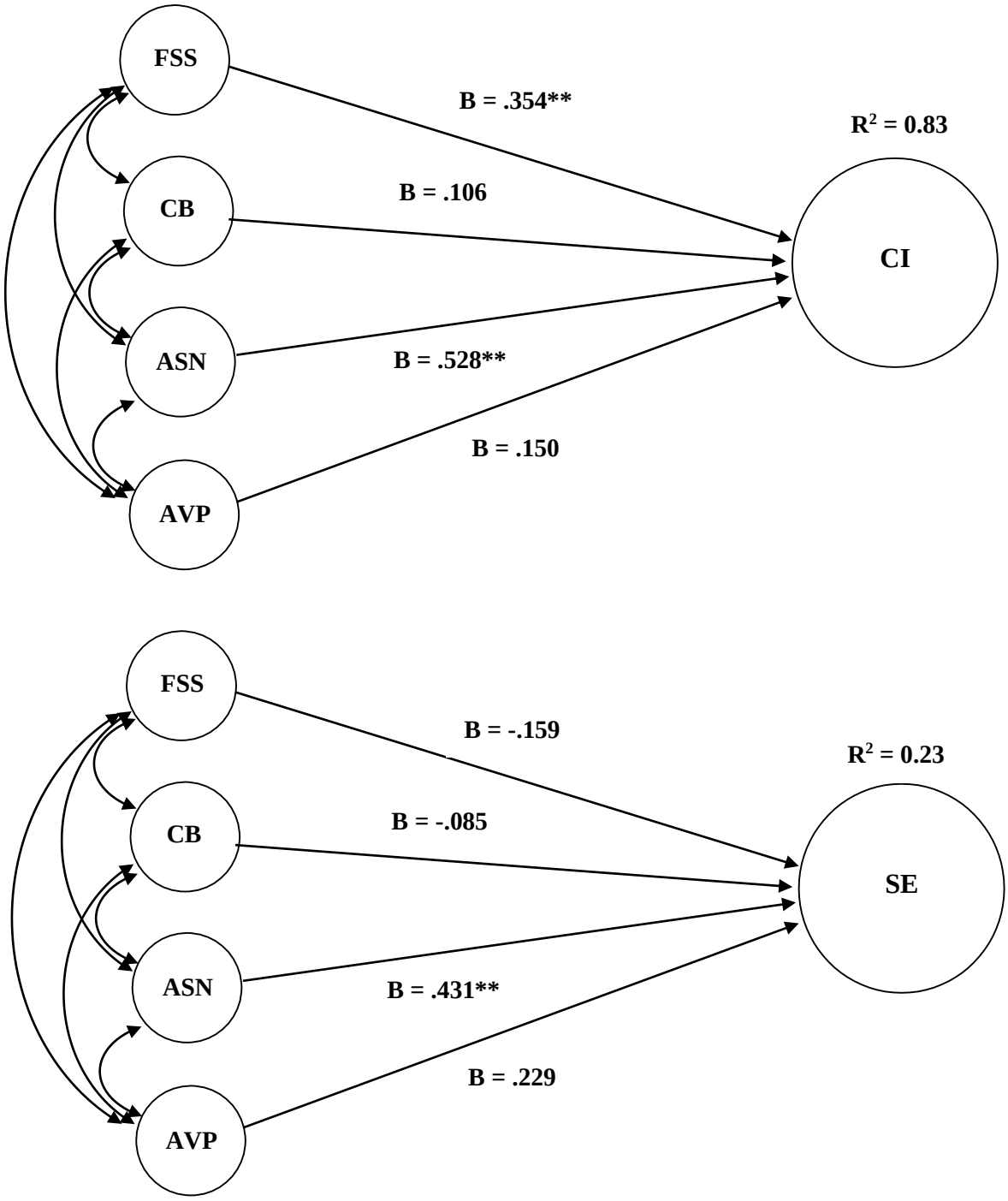


Figure 8. The predictive paths of criterion and predictor constructs. CI = Community involvement construct; SE = Social engagement construct; FSS = Functional skills construct; CB = Classroom behaviors construct; ASN = Access to the social networks construct; AVP = Access to the vocational program construct.
** $p < .01$.

Appendices

Appendix A: Tables for Comprehensive Multi-stage Sampling Analysis

Table A1: Predictors, C_p Values, AIC, and BIC for Best and Near-Best Models

Model	Predictor(s)	C_p	AIC	BIC
3	PT, ND, EG	2.530	747.156	749.324
4	PT, ND, EG, PES	0.477	744.985	747.356
5	PT, SR, ND, CM, PES	-1.468	742.860	745.500
6	PT, SR, ND, EG, CM, PES	-2.915	741.203	744.152
7	PT, SC, SR, ND, EG, CM, PES	-2.750	741.235	744.446
8	PT, SC, SR, ND, BG, CM, PES, GP	-2.345	741.512	745.001
9	PT, SC, SR, ND, BG, PA, CM, PES, TP	-1.843	741.884	745.671
10	PT, SC, SR, ND, BG, PA, CM, AS, PES, TP	-1.459	742.116	746.243
11	PT, SC, SR, ND, BG, PA, CM, AS, PES, GP, TP	-0.361	743.124	747.543
12	PT, SC, SR, ND, EG, BG, PA, CM, AS, PES, GP, TP	1.048	744.472	749.164
13	PT, SC, SR, GH, ND, BG, PA, CM, AS, PES, PEJ, GP, TP	2.292	745.636	750.633
14	PT, SC, DL, SR, GH, ND, BG, PA, CM, AS, PES, PEJ, GP, TP	3.709	746.990	752.283

Note. PT = Percentage of time spent in academic general education classes; SC = Self-care scale; DL = Do laundry; SR = Straighten up his/her own room; GH = Youth's general health; ND = Number of domains affected by disability; EG = Belongs to extracurricular school group; BG = Belongs to groups not just for those with disabilities; PA= Has a personal assistant or aide; AS = Age first received services; CM = Level of curriculum modification; PES = Parents' expectations the student will attend school after high school; PEJ = Parents' expectations the student will get a paid job; GP = Group participation; TP = Role in transition planning.

Table A2: Bootstrapped Regression Coefficient, Odds Ratios, and Confidence Interval (CI) for Best Model

Model	Predictors	*B*	95% CI		Odds Ratio
			Lower	Upper	
6	PT	-0.041	-0.060	-0.030	0.959
	SR	0.017	-0.163	0.220	1.018
	ND	0.340	0.211	0.489	1.405
	EG	-0.001	-0.005	0.975	0.999
	CM	0.001	0.000	0.002	1.001
	PES	0.487	0.252	0.696	1.627

Note. PT = Percentage of time spent in academic general education classes; SR = Straighten up his/her own room; ND = Number of domains affected by disability; EG = Belongs to extracurricular school group; CM = Level of curriculum modification; PES = Parents' expectations the student will attend school after high school.

Appendix B: Approval Letter from the Human Subjects Committee-Lawrence

10/1/2012
HSCL #20408

Hyun Joo Lee
SPED
232 JRP

The Human Subjects Committee Lawrence Campus (HSCL) has reviewed your research project application

20408 LeeMorningstar (SPED) A Secondary Analysis of the National Longitudinal Transition Study 2: Investigating the Relationship between Opportunities and Postschool Outcomes for Youths with Significant Disabilities

and approved this project under the expedited procedure provided in 45 CFR 46.110 (f) (5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for non-research purposes. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

Since your research presents no risk to participants and involves no procedures for which written consent is normally required outside of the research context HSCL has waived the requirement for a signed consent form (45 CFR 46.117 (c) (2).

1. At designated intervals until the project is completed, a Project Status Report must be returned to the HSCL office.
2. Any significant change in the experimental procedure as described should be reviewed by this Committee prior to altering the project.
3. Notify HSCL about any new investigators not named in original application. Note that new investigators must take the online tutorial at http://www.rcr.ku.edu/hscl/hsp_tutorial/000.shtml.
4. Any injury to a subject because of the research procedure must be reported to the Committee immediately.
5. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity. If you use a signed consent form, provide a copy of the consent form to subjects at the time of consent.
6. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.

Please inform HSCL when this project is terminated. You must also provide HSCL with an annual status report to maintain HSCL approval. Unless renewed, approval lapses one year after approval date. If your project receives funding which requests an annual update approval, you must request this from HSCL one month prior to the annual update. Thanks for your cooperation. If you have any questions, please contact me.

Sincerely,

Stephanie Dyson Elms
Coordinator
Human Subjects Committee – Lawrence

cc: Mary Morningstar

APPROVAL OF PROTOCOL

March 25, 2015

Hyunjoo Lee
zoo0111@ku.edu

Dear Hyunjoo Lee:
On 3/25/2015, the IRB reviewed the following submission:

Type of Review: Initial Study
Title of Study: A Secondary Analysis of the National Longitudinal Transition Study 2: Investigating the Relationship between Opportunities and Postschool Outcomes for Youths with Significant Disabilities
Investigator: Hyunjoo Lee
IRB ID: STUDY00002321
Funding: None
Grant ID: None
Documents Reviewed: • HSCL_Initial_Submission_Form 03-05-2015.pdf

The IRB approved the study on 3/25/2015.

1. Notify HSCL about any new investigators not named in the original application. Note that new investigators must take the online tutorial at https://rgs.drupal.ku.edu/human_subjects_compliance_training .
2. Any injury to a subject because of the research procedure must be reported immediately.
3. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity.

Continuing review is not required for this project, however you are required to report any significant changes to the protocol prior to altering the project.

Please note university data security and handling requirements for your project: https://documents.ku.edu/policies/IT/DataClassificationandHandlingProceduresGuide.htm

You must use the final, watermarked version of the consent form, available under the "Documents" tab in eCompliance.

Sincerely,

Stephanie Dyson Elms, MPA
IRB Administrator, KU Lawrence Campus